MAGAZINE

OF

ZOOLOGY AND BOTANY.

ORIGINAL COMMUNICATIONS.

I.—*Observations on the importance of a Local Fauna;—exemplified in the Fauna of Twizel.* By P. J. Selby, F. R. S. E., &c.

It has frequently occurred to the writer, that our native or British zoology might be greatly improved as well as advanced, by well-arranged and carefully-collected Faunas, even where these were confined to districts of very limited extent. The improvement here alluded to, is not the mere extension of the list by the addition of new, or previously undiscovered species, but has in view the additional and interesting information that might be collected and amassed respecting many of those already recorded, in whatever relates to their natural history, taking it in its most extensive signification, and of which, in many cases, we are yet either altogether ignorant, or but very partially informed. English botany, it will generally be allowed, has been greatly advanced and enriched by local Floras, and no good reason seems to exist, why our zoology should not receive equal advantages from Faunas of a similar character. These, however, to be of that service to zoology which is here contemplated, ought to be conducted upon a plan, so as to embrace all those objects that have any reference to, or are in any way connected with the history of the various beings we have in view. Thus the situation, relative height above the sea, and general features of the district to be examined, ought previously to be ascertained, in order to trace whether in any way, or to what extent, these local circumstances affect the distribution of genera and species. Its geological character also should be studied and specified, as this, to a considerable extent, affects and influences its botanical aspect, and conse-

quently must, directly or indirectly, have its effect as regards the distribution of species, particularly that of the invertebrated classes, and upon those insects belonging to the order Lepidoptera, as well as other herbivorous insects which feed upon plants peculiar to certain soils and situations. The habits and manners of every tribe should be watched and diligently observed; the anatomy and peculiarities of individuals should also form a prominent feature in the investigation. In regard to insects, attention should be given to the larvæ, their changes, and other facts connected with this state of being carefully ascertained, the period of appearance, and that of the duration of the imago state regularly noted down, the habitats recorded, and, in short, every thing connected with the economy of life should be made an object of attentive consideration. It is not necessary that the district selected for investigation should be extensive, indeed it would be preferable, provided a sufficient number of zealous naturalists could be found in different parts of the country, willing to undertake the task, that it should be of limited or moderate size, so as easily to be commanded, and its boundaries visited without labour or fatigue. Its living treasures might then be investigated at leisure during the daily walk, affording an object of pursuit at once delightful and instructive; repeated observations and experiments, to verify facts, might be made upon particular species, their habits and economy observed in detail, and under various aspects and conditions; and the investigation, being so entirely under the observer's command, might be extended if agreeable, to more than one department at a time. A comparison of several Faunas, made in different parts of the kingdom, and thus conducted, there can be little doubt, would present results of great interest and importance to zoology. Among many others, the geographical as well as the local distribution of genera and species would be better ascertained, and in all probability, a knowledge of the principal causes which affect the latter accounted for, so that the naturalist in future, upon the mere inspection of a district, might be able to predicate with some degree of confidence, its principal zoological productions. The discovery of many new species might also be expected, and the natural history of all, better ascertained and understood; thus paving the way, by the accumulation of a mass of valuable materials, towards the compilation of a British zoology, superior to any we at present possess. Upon this sort of plan a Fauna has been commenced, embracing a very limited district, and, although it has not been long in operation, the success that has already attended it, as well as the pleasure it affords, and the increasing interest it creates, gives ample

encouragement to proceed; and as the progress of such an undertaking may not be altogether unacceptable, it is proposed to give from time to time a list of the species taken in the various departments, with such remarks and observations as may be of interest, or calculated to throw any additional light upon the history of the various objects that come under review.

The district proposed for investigation is situated in the northern part of Northumberland, and contains an area of nearly 700 acres; its distance from the nearest part of the coast is about three miles and a-half; its elevation above the sea from 250 to upwards of 300 feet. The general character of the surface soil may be termed stiff and tenacious, (though it varies in parts) resting upon limestone and the other coal measures, the whole of the district forming a portion of one of the small coal basins so prevalent in this portion of that county. It is intersected by several dells or deans, producing a natural growth of birch, hazel, alder, and other underwood, or else planted, and each with a rill or burn running at the bottom, one of considerable size, and dignified with the name of the Waren. More than a third of the rest of this range is in wood and plantation.

The list of Mammalia, as might be expected from the extent and nature of the district, is limited, and composed of well-known species, common to almost every part of the kingdom, and it therefore offers but little subject for remark. It is as follows:—

Vespertilio pipistrellus, Gmel.
Plecotus auritus, Geoff.
Mustela putorius, Linn.
——— vulgaris, Gmel.
——— erminea, Linn.
Lutra vulgaris, Desm.
Canis vulpes, Linn.
Talpa Europæa, Linn.
Sorex araneus, Linn.
——— fodiens, Gmel.
Sorex remifer, Geoff.
Erinaceus Europæus, Linn.
Mus sylvaticus, Linn.
——musculus, Linn.
——decumanus, Pall.
Arvicola amphibia, Desm.
——— agrestis, Flem.
Lepus timidus, Linn.
———cuniculus, Linn.

In regard to the bats, it is probable there are more species than the two already detected, but the habits of the family render it a difficult matter to obtain specimens for examination.

The ermine or stoat is numerous, more so than the weasel. In severe winters they all assume the arctic dress; in milder seasons, it has been observed that this change does not take place so frequently, or to such an extent in the males as in the other sex. The change of colour takes place in the existing fur, and is not produced by the acquisition of an entire new supply or coat of hair. It is well known that they possess a high developement of the olfactory

organs, and frequently hunt down their prey by the scent. This interesting sight the writer has witnessed several times, where the object of pursuit was a leveret or a rabbit. The chase was sometimes of long continuance, although the circuit of operations was confined to a very moderate space, and during the whole of its continuance, it was evident that the ermine trusted more to its nose than to its eyes. It is also a lover of fish, at least of eels, whose remains have been met with when digging the animal out of the burrow, into which it had been traced, but how this slippery prey is captured has not yet been ascertained. The otter is now of rare occurrence, and the last time the tracks of this animal were observed, is about three years since. The mole is very plentiful, finding a secure retreat in the plantations and deans. Varieties of a cream-colour, as well as of a fine silvery grey, are frequently taken in the traps. The water shrew (Sorex fodiens) is in tolerable plenty about the margins of the rivulets. Like its congener, the Sorex araneus, it is often found dead upon the paths. Upon examination, these all appear to be wounded or bitten near the same part of the body; the marks of the teeth by which the bites are inflicted are minute; and there is good reason to believe, that these their death-wounds are received in battles or contests, which take place at certain periods of the year. May not this be a wise provision for keeping within due bounds, a race of animals which appear distasteful to most others, and therefore not much pursued as an object of prey? It has besides been observed, that this mortality only takes place to any considerable extent when the species are more than usually abundant. When diving, and in search of its food among the stones or beneath the surface, the water shrew appears like a moving mass of quicksilver, from the sparkling appearance of the fur, which repels the access or immediate contact of the water. The *Sorex remifer*, which occurs in several of the southern counties, has likewise been detected, a dead specimen having been found upon a path-way, answering in every particular the description of the species, by Jenyns, Bell, &c. The badger, it may be observed, used formerly to have his burrow within the district; and the wild-cat, *Felis catus*, was to be found, not more than twelve years ago, within a distance of three miles.

(To be continued.)

II.—*Observations on the construction of a Local Flora.* By H. Cotterel Watson, Esq.

In the first and second numbers of this Magazine, some remarks were made on the increased attention given to the study of

British Botany, and on the number of Floras lately published, descriptive of the vegetable productions of the British islands. While the general Floras have been thus increased in number, and additional species have been yearly added to the lists of our native plants enumerated in them, the department of local botany has been by no means neglected. Perhaps, indeed, we might say of this department, that it has been advanced in more than an equal degree; our local descriptive catalogues having rapidly multiplied during the present century, and the published localities of the less common species of plants having been doubled or trebled in the same space of time. The writing of these appears to be still proceeding briskly enough; and being at once an easy task, and an agreeable employment to botanists, whose professional ties limit their range of observation to one small circuit, the public is likely to continue to receive the benefit of their exertions. But taking such works on the broad ground of public usefulness, or their applicability to the general purposes of science, we have to lament that the authors of them usually contrive to reduce this to its *minimum* of amount, by contracting the circulation of their books, through the ridiculously high prices at which they are published. We do not intend to say that the books themselves are at all overcharged, looking to the very limited demand which can be anticipated for such works; indeed, we feel assured, that the greater number of works of this kind, produce only a pecuniary loss to their authors. What we do condemn, is the expensive form in which the local Floras are written. Half-a-crown, we think, is a very fair price for a local Flora, and we can scarcely conceive a case in which it would be really necessary to double this sum. The authors, however, contrive to swell their works to a size that cannot be sold under four or six times this amount; and many of them are then published with a certain loss. This addition to the bulk of the books is too often made up only of long descriptions of species, with references to figures and to other works, all of which may be found done equally well, if not better, in the general Floras; and from which, in two out of every three cases, they are merely transcribed with the pen, or cut out wholesale with the scissors. In the hope of inducing local botanists to render their exertions more available to science, we shall throw out some hints upon the objects and construction of local Floras and catalogues; and in doing this, we shall take it for granted, that the authors are really desirous to convey information to the public, and to make their works serviceable to others. So very moderate an amount of original talent is imperatively required for constructing a local

Flora, by the ready mode of transcribing from the general works of a similar nature, and so small a share of fame attaches to the most laborious, and even original, exertions in this way, that we cannot attribute a great share of the motives for writing, to the small vanity of making a book, large or little.

First, a local Flora, we take it, ought to relate to a definite area, and not pretend to include a wider space than has been really and well investigated. In neglect of the latter part of this rule, all the negative evidence, or that touching the absence of species, becomes altogether worthless; and, in some instances, it is rendered worse than worthless, by inducing botanists to presume the absence of particular species, within the specified area, contrary to what is the fact. If no definite limits be fixed, both positive and negative evidence are greatly diminished in value, and the pretended local Flora is very little better than an imperfectly got up fragment of a general Flora. *Secondly*, we should have a full list of species and the more remarkable varieties; the nomenclature being adapted to that of the standard Floras which relate to Britain generally; generic and specific characters, descriptions and references, being altogether omitted. The necessity of as full a list of species as possible is founded on the importance of thus marking the absent species, as well as those which do exist within the area of the Flora. Convenience suggests a uniformity of nomenclature with that employed in the general Floras; the synonyms, from two or three of the standard works of this kind, being added to species described in such works under different names. All references to pages, &c. are thus rendered unnecessary, the name itself becoming a clear and unexceptionable reference; while the omission of other references takes off so much from the bulk and cost of the work. The frequent custom of referring to the figures in *English Botany* is altogether unnecessary. Only the local student can need such references, and he finds them all in the general Floras; if, indeed, as often happens, these references be not utterly useless to him, from want of access to the plates cited. It is on the score of their being unavoidably attended by a great augmentation in the prices of the works, without any equivalent advantage, that we would make a clean sweeping away of all descriptions of plants, whether limited to the generic and specific characters, or being of a more detailed kind. To persons who already know the plants, such descriptions are quite unnecessary, and almost every student of botany will possess one of the general Floras, in which the descriptions may be found set forth quite as well. Indeed, as we have intimated, such descriptions are

usually transcribed from the general works into the local ones, and the public is thus called on to pay for the same matter over and over again, under different names. Exceptions are of course quite allowable in cases where particular species or varieties have been previously inaccurately or insufficiently described. But if such descriptions and references, as are here objected to, be unnecessary in a local Flora, and serve only to add much to the cost, with little or no addition to the value of the books, the thrusting in of "Introductions to Botany" is a most inexcusable and absurd way of swelling out a local Flora; and it is also an injudicious one, since all unnecessary increase of cost must be attended with a corresponding decrease of sale. And still more absurd is it, for authors to repeat the generic and specific characters twice over, in order to present two arrangements, the Linnean and Jussieuan; as if a mere list of the genera were not amply sufficient to meet such an object! *Thirdly*, we should desire to see the degree of scarcity or abundance of each species mentioned, in as close an accordance as possible with some fixed scale. The scarcity or abundance of the species, *in the tract under consideration*, is what any reader would reasonably expect to be intended, when a local author speaks of a plant being "rare" or "common." Yet it is unfortunately true, that these and other such adjectives, in different instances, are copied from the general Floras, and applied to the species of a local tract in direct contradiction to what is the fact there. *Fourthly*, the time of flowering, and the soil and situation affected by each species, should be given from actual observation. Had we not indisputable proofs that the notices of these points were frequently copied from the general Floras, we might have felt disposed to doubt that writers could be guilty of the slovenly, not to say *dishonest*, practice of copying local particulars, from works not exclusively (or not at all!) referring to the area to which such copied particulars are applied; yet this is done without qualification or acknowledgment. Such a course can scarcely fail of leading the copyists to put forth their own blundering misapplications as actual facts, and of misleading others where the blunders are less glaringly apparent. What can be more unmeaning, or more deceptive, than such indications as "on many moors in the north" occurring in a Flora relating to a tract in the south of England; or, "frequent on mountains" given as the situation of a species found very locally in a tract quite destitute of mountains; or, "chiefly on a chalky soil," for the place of growth of another species, in a county without a yard of chalk through its whole extent! Such errors as these, however, do exist in some works,

and arise from the usual situation and frequency of the particular species being copied *verbatim* from a general Flora, and carelessly applied to a local tract in utter defiance of fact. The same sort of mistakes exist as to the times of flowering, through authors copying their intimations of such from the works of others, and then publishing them as if set down on their own observation. *Fifthly*, the general distribution of each species, and the localities of the rarer ones, are to be precisely shown. These are commonly indicated with more care and accuracy than is bestowed upon other matters, in our local Floras; but there is wide room for improvement even here. In addition to stating the known localities for the rarer species, authors should particularly distinguish those places in which they have themselves seen the plants growing, as well as those suspected to be erroneous, or in which the species has become extinct. Facility for procuring specimens is one of the principal advantages to be gained from having the localities especially pointed out. This is little aided by the vague indications of a species growing "near" a particular town or village, unless it be so frequent that a person is almost certain to see it when arriving at the town or village mentioned. For guiding to a very local species, a fixed point adjacent to its locality, with the bearing and distance of the latter from such point, ought to be specified. We are aware that vague directions are sometimes given with the express design of preventing success to one seeking the plant, from the pretended—or, silly if not pretended—fear lest species should be eradicated. They might as well be eradicated as not be found; and of what consequence is it, if a species do disappear from our soil? It is the sheer and selfish babyism of the old *virtuoso*, not the expanded conceptions of the man of science, or the dictates of an enlarged and liberal mind, that whispers so paltry an excuse for studied concealment. *Sixthly*, We should recommend the history of the species to be attended to. Under this head, we would include the possible or probable introduction of the species into the tract under consideration; changes that have occurred in its comparative scarcity or abundance; alterations in character, size, or general appearance, in connection with differences of situation and season. The degree of probability that a species, especially if a rare one, has been originally introduced by human agency, we regret to say, is sometimes misrepresented by local botanists. Botanical writers, too, often exhibit a great desire to swell their lists of species by any means, and to exalt themselves or their friends into discoverers of new species or localities. Strict impartiality is scarcely compatible with the existence of such wishes,

and accordingly, we always take the certificates of species being "truly indigenous," "undoubtedly wild," "far from houses," and so forth, with some grains of reservation or qualification.

That all botanists will agree with our views, as to the most eligible form for local Floras, we are not confident enough to hope, or ignorant enough to expect. Those heretofore published exhibit sufficing proofs of striking dissimilarity between the ideas of their respective authors. What appears to us to be one of the simplest and best models for a local Flora, among those hitherto published, occurs in a recent Natural History of Yarmouth, by the brothers Paget. This is merely a list of species, arranged according to the natural method, without references or descriptions; the names being made to correspond with those used in Hooker's British Flora. The usual situations and comparative frequency of the species are almost always intimated; and a few localities, for the rarer kinds, are particularly specified; all such being understood to be inserted on the responsibility of the authors, unless other authority is expressly mentioned. The whole list of the phænogamic plants is thus comprehended in about thirty octavo pages. Woodford's Catalogue of Plants near Edinburgh is also very simple, being a list of species, with one or more localities for each; localities, verified by the author, being distinguished from the others, and the names being adapted to the works of Smith, Hooker, and Greville. The Flora of Bath corresponds with that for Yarmouth, but the English names are added, and also a very few references and descriptions, where particularly necessary. The phænogamic plants, of these two latter works, are contained in about sixty small pages. The Floras of Glasgow and Tunbridge Wells are catalogues of species, having both the technical and English names; also the times of flowering, situations, comparative frequency, and some specified stations. In the former work, the duration of the species is added, and in the latter, references to the figures of English Botany. In these works, the phænogamic plants fill a hundred and fifteen pages. The Catalogue of Anglesea plants, in Welsh Botanology, is nearly on the same plan; but we have here the addition of the Welsh names of plants, and the omission of references to figures, as well as the equally unnecessary notices of the duration of the species. All the preceding may be called *Floral Catalogues;* and they do not in any way claim to be descriptive lists. The Floras of Oxford (Sibthorpe), Bedford, Cambridge, Lanark, Edinburgh, and Berwick, are on a much more extended scale; including descriptions, references, synonyms, and other matters, such as we look for in the Flo-

ra of a kingdom. They are, consequently, voluminous in size, and their cost necessarily approaches to the price paid for a general Flora of Britain. The two last have an intrinsic value, in original descriptions, &c. independently of their use as local lists merely. The Midland Flora, and that of Oxford and the adjacent counties (Walker), are further augmented by "Introductions to Botany;" and the Flora of Devon, by repeating generic and specific characters, in two arrangements, is really *two* Floras under one cover. Lastly, the Flora of Northumberland and Durham is expanded into a hundred and forty quarto pages, (including cryptogamic plants), with double columns, although printed in a close small type, and destitute of descriptions or technical characters. The bulk of this work is greatly increased by the name of each species being followed by references usually to four or five works relating to British Botany; ninety-nine in the hundred of such references not being at all required in a local catalogue. The work, however, is really carefully got up, and is a valuable production; although, taking it in our present light of a local catalogue only, much time and talent has been unnecessarily wasted on it. We mean, that the scientific public would have drawn more advantage from a cheap list or Flora, which might have been written with a quarter of the trouble, and published at a quarter of the price. After the preceding remarks, it is scarcely requisite to say, that we give the preference to the floral catalogues first mentioned, and would willingly limit all such works to fifty pages at the outside; feeling assured that half this number would usually suffice, and that all additions go to increase the bulk and price in a much greater ratio than they can add to the usefulness or the circulation. Let it be remembered, however, that we speak only with respect to the general usefulness of such works to the public. When designed chiefly for local circulation, to be used as class works or other special purposes, change of plan may be necessary.

III.—*On the Natural History and Relations of the family of Cuculidæ or Cuckoos, with a view to determine the series of their variation.* By William Swainson, F.R. & L.S., &c. (Continued from page 213.)

The Cuculinæ or Genuine Cuckoos.

As the pre-eminent type of the whole family, a perfect example is seen in the common cuckoo. On examining this bird we observe the following external characters; 1. the bill is consi-

derably wider at the base than it is high; although, beyond the nostrils, it rather suddenly contracts, and becomes compressed; 2. the nostrils are naked, and undefended; opening by a circular aperture, round which is a narrow elevated rim; 3. the upper mandible has a very slight sinuosity at its tip, assuming the form of that notch which is usually seen in dentirostral birds; 4. the wings are of considerable length, nearly reaching to two-thirds the length of the tail, and they are so far pointed, that beyond the fourth quill they begin rapidly to diminish in length; 5. the feet are remarkably short, the tarsus not being longer than the hallux or real hind toe, and the tarsus is thickly clothed with feathers to nearly half its length. Finally, we may remark in this genus, and in nearly all the birds which belong to this sub-family, a decided elongation of the upper cover-feathers of the tail, which are always thick set, narrow, and generally pointed; they are likewise so rigid that they can only be compared to those of the *Ceblepyrinæ* or caterpillar-catchers, forming the corresponding type in the circle of the *Laniadæ*.

Popular interest has been so much confined to the parasitic habits of the cuckoo, that upon many other points of its economy, we are still in comparative ignorance. Hence it is, that we cannot trace, so fully as could be wished, the influence which the structure just described exercises upon the habits and manners of such birds as possess it. We know, however, that all the genuine cuckoos fly with strength and rapidity. Most of them, in fact, are migratory birds. The common species comes to us every spring, from Northern Africa, or Asia Minor, and returns in autumn. This we know from personal observation; for vast numbers arrive in the spring in Sicily and Naples, in company with the Bee-eaters, Orioles, Hoopoes, and other migratory birds; but after remaining a short time, they appear to direct their flight northward, from whence they return in August and September. The form of the nostrils in the typical cuckoos is very peculiar, and I believe that future observations will shew this structure to be intimately connected with their parasitic habits. The nests of those species in which the cuckoo deposits its eggs, we all know, are built in the thickest and most central parts of trees or bushes, to discover which, superior powers of smell have been given to the Toucans (who feed upon the eggs or young,) and, in a less degree, are probably conferred upon the cuckoos, to facilitate their search after a foster-parent for their young. How far this idea may be correct, future observations will determine. Certain, however, it is, that this peculiar-shaped nostril is restricted to such cuckoos as are parasitic, for the whole of the *Coccyzinæ* have the aperture of a lengthened oval shape, or in the form of a

slit, and all we know of these birds sanctions the idea that they are not parasitic. The shortness of the feet, in the typical cuckoos, is another important distinction, and leads to the belief that these members are much less used than those of the *Coccyzinæ*, whose habits we have already mentioned when alluding to the cuckoos of South America, all of which are excluded from the group now under consideration. The English cuckoo, no doubt, searches for its food among foliage, but its nature is so shy, that we never have been fortunate enough to witness its mode of feeding. Montagu, however, one of the best authorities we can cite, says, that its principal food consists of caterpillars,* so that it not only possesses the general cast of colours, and much of the structure of its prototypes, the *Ceblepyrinæ*, but actually feeds on the same description of insects.† In both groups, the predominant colours are grey, transversely banded beneath; both have pointed wings, thick set and stiff tail-covers, very short feet, broad bills, and smooth gapes. Their skins, also, are unusually thin. We thus perceive, that all the peculiarities of the typical cuckoos are intimately connected with what we know of their economy, and are in harmony with the analogical relations they bear to their types in other families. The shortness of their feet, indeed, might appear at first to militate against the theory of their representing the grallatorial birds, seeing that these latter are proverbial for a structure totally opposite, having, in fact, the longest legs of any birds in existence; but this objection would be founded on very partial reasoning. It is well known that the *Tenuirostres* represent the *Grallatores;* now the cuckoos represent *both;* but this double representation would not be apparent, if *all* the analogies of their structure were drawn from only one of these groups. Nature, therefore, has combined them, and in a most beautiful manner. The *Tenuirostres* have the shortest feet of all the incessorial tribes, and the cuckoos have the shortest feet of all the *Scansores*. On the other hand, their analogy to the *Grallatores* is preserved by their remarkably long tail-covers, a structure which assimilates them as much to the waders, as their short feet does to the humming-birds. The nature of the food, again, of all three groups, evinces another bond of union. They all live upon the very softest animal substances. Marine worms are the caterpillars of the

* Ornithological Dictionary. Original edition.

† In an open and muirland district where the cuckoo is very common, we have always found, during May and June, that the stomachs were filled with the remains of caterpillars which fed on the various plants frequent in such localities. Among them those of the *Lasiocampæ* formed a great proportion, and hairy species seem to be preferred.—Edit.

sands, just as *larva* are the caterpillars of trees; while the soft, delicate, dipterous insects upon which the humming-birds occasionally feed, by licking them from the flowers with their tongue, are perfectly analogous to the soft food of the waders, the cuckoos, the caterpillar catchers *(Ceblepyrinæ)*, and the orioles *(Oriolinæ.)*

On the geographic distribution of the typical cuckoos, little can be said of a general nature, but what is subject to exceptions when treating of the subordinate groups. Those composing the genus *Cuculus* are restricted entirely to the Old World, and are abundant in those regions mid-way between Europe and New Holland, the two extremes of their latitudinal range. In the other, or longitudinal direction, they extend from Western Africa to the Indian islands. The birds which we now, for the first time, distinguish as the genus *Oxylophus*, are also excluded from the New World, and appear to be confined to the tropical latitudes of Africa and India, where they represent the American genus *Erythrophrys*. The two remaining genera of this division are likewise excluded from the New World, *Chalcites* being African, while *Eudynamys* belongs more especially to Australia and the Indian islands.

In venturing to characterize so many new groups in this family, it is incumbent upon me to lay before ornithologists those reasons which have led to this determination. The present state of our science demands this, for the time has gone by when genera will be received on the unsupported opinion of the mere systematist, without any appeal to acknowledged facts, or palpable analogies; and it is the more necessary to avoid this error in the present instance, because many new genera of the *Cuculidæ* have recently been proposed in the French publications, which I cannot possibly adopt. They appear to me, in almost every instance, forced and artificial, neither characterized by their geographic distribution, or by those variations of structure which are their true distinctions. I may be excused, also, from adopting such names as *Jaccocua*, *Bubutus*, *Guira*, &c. as they cannot be admitted into our classical nomenclature, without a violation of those rules to which we are all bound to adhere.

The distinctions by which I propose to characterize the genus *Cuculus* have already been dwelt upon: its exclusive or essential character, however, is to be found in the great breadth and convexity of the bill at the base, and in the short and feathered tarsus: the plumage, moreover, is never vivid, and the upper mandible has a slight or obsolete notch. From the great uniformity of colour which runs through this genus, I am persuaded that several species have been overlooked as varieties of the European cuckoo, some of

which I propose to describe hereafter. All these are more or less of a grey or slate-colour, transversely banded, in various ways, beneath, upon a whitish ground. In the *Cuculus nigricans* (Zoological Ill. ii. pl. 7,) however, we have a species, nearly typical in its structure, but aberrant in its colours: the wing begins to have a less attenuated form, the second quill being of a length intermediate between the first and third, instead of, as in our cuckoo, only a little shorter than the third. We look upon this bird, therefore, as conducting us to the genus *Oxylophus*, under which, in a word, I arrange all those birds of M. Vieillot's genus *Coccyzus*, inhabiting the Old World, which have pointed wings. Like the typical cuckoos we have just left, these birds* are likewise parasitic; but they are distinguished by having wings not quite so long, the third quill being shorter than the fourth: the sides of the bill are more compressed, the culmen less convex, and narrower at the base, and the upper mandible is perfectly entire; the tarsus is longer, but it is still inferior to the longest toe. Most of the species have conspicuous crests, the feathers of which are narrow and pointed. The *Oxylophus Levaillantii* (Zool. Ill. ii. pl. 13,) formerly described as an example of the old genus *Coccyzus*, and *Ox. edolius* (Le Vail. Ois. d'Af. v. pl. 207–8,) are both types of this group, and are at once distinguished, as before remarked, from all of the *Coccyzinæ*, by their longer, and more pointed wings.

There are two or three cuckoos of North America, which I feel persuaded are of a distinct type from those just mentioned, although there is some difficulty in determining what are their external characteristics. We are assured by Levaillant, that all the species of *Oxylophus* discovered by him are parasitic; but the American birds to which I now allude (the Carolina and black-billed cuckoos of Wilson,) are not so, for both migrate into the United States for the purpose of breeding, so that, however their external anatomy may assimilate them to the genus *Oxylophus*, their internal structure *must* be different. Their colouring, also, is altogether peculiar, plainly intimating their analogy to the Scansorial creepers, and to many of the undoubted representatives of that family. For the present, the formation of their wings will distinguish them at once from *Oxylophus*, for the third quill is the longest of all; and this makes the wing as much pointed as that of *Cuculus*. Independent of the two species above-mentioned of this new genus (*Erythrophrys*,) there is another found in Brazil.

I feel much more scrupulous in adopting the genus *Chalcites*, than in proposing that of *Erythrophrys*. The beautiful little shining

* Levaillant's Oiseaux d'Afrique.

cuckoos, indeed, which have thus been detached, have altogether the appearance of belonging to a different type than those of the genus *Cuculus;* and this idea is strengthened, when we find there are already four or five species, all distinguished at first sight by their diminutive size, and their beautiful golden-green plumage. On the other hand, their actual structure is so completely that of an European group, that I must beg to be understood as being by no means satisfied on the propriety of the separation. For the present, however, I shall adopt this genus, conceiving that these splendid little birds may probably constitute the tenuirostral type of the *Cuculinæ,* in which case they will be analogous to the humming-birds, and nearly all those genera whose plumage is ornamented with metallic colours. The attempt that has been made to define the group by its bill, nostrils, &c. as distinct from the cuckoos, is singularly unsuccessful; while those light shades of difference really existing between *Chalcites* and *Cuculus* have been completely overlooked. *Chalcites,* in fact, has the bill, nostrils, feet, and wings of *Cuculus,* with this difference only, that the tip of the upper mandible is without the slightest indication of a notch: the second and third quill are longer than the fourth, and the feathers of the rump and upper tail-covers, instead of being thick-set and rigid, are of the same degree of density and softness as in ordinary birds. We have seen, that, however dissimilar in their appearance the foregoing groups of the *Cuculinæ* may be, yet that the variation of their external structure is but slight. This consideration has much weight with me in the temporary adoption of M. Lesson's genus *Chalcites,* for we have just seen an example, in *Erythrophrys,* where there is an equally slight variation in external form, yet a most important one in economy and internal organization.

The genus *Eudynamys* of MM. Horsefield and Vigors rests on a much better foundation than the last. It is at once distinguished from *Cuculus* by a stronger and thicker bill, the under mandible of which is not only destitute of any curve, but has a decided angle at the under ridge. The feet are also proportionably strong, and are the most robust of all those groups we have yet noticed: the tarsus is longer, and almost naked, while the rump feathers are short and soft. In other respects, such as the wing, nostrils, and tail, this genus agrees with Cuculus. The nostrils, however, judging from dried specimens, appear to be more oval than round. The great size of the bill in this genus induces me to think it is that which represents the Toucans, in which case it will be a fissirostral type.

All the Cuckoos I have yet seen, with more or less pointed

wings, and circular nostrils, and whose habits are parasitic, will arrange themselves under one or other of the foregoing genera. Nor are there wanting considerations, drawn from their analogical resemblances in other groups, which render it highly probable that they serve to indicate a circular group. *Erythrophrys*, as the rasorial type, resembles the rufous-winged scansorial creeper; and as it is by this group that the parasitic cuckoos lead immediately to those which build nests; so we have the external characters of *Oxylophus* joined to the economy of *Coccyzus*. *Chalcites*, again, as representing the humming-birds, may be viewed as the tenuirostral type; while *Eudynamys*, with its large bill, and black glossy plumage, will become the representative of the Toucans, and of the fissirostral type. It may be questioned, indeed, whether *Cuculus* or *Oxylophus* follows *Eudynamys*; but I incline to the series in which they are here placed, from the obvious affinity of *Erythrophrys* to *Oxylophus*.

Concentrating the foregoing remarks, we may state the essential external characters of the sub-family I have now attempted to illustrate, in the following table of the

Sub-family Cuculinæ.

CUCULUS, *Linn.*

Bill broad at the base, compressed beyond, the upper mandible obsoletely notched; nostrils circular, with a tumid margin; wings long, pointed, the third quill longest, the second and fourth of equal length; feet slender, very short, tarsi feathered, posteriorly almost to the toes; rump and upper tail-covers long, thick-set, and rigid. Inhabits the old world; parasitic.

Type.—Cuculus canorus, *Lin.*

OXYLOPHUS, *Sw.*

Bill slender, considerably compressed nearly its whole length; upper mandible entire; nostrils ovately round; head crested; wings moderate, pointed, shorter than the tail-covers, the fourth quill longest; tarsi moderate, naked; upper tail-covers long, but not rigid. Inhabits the old world; parasitic.

Type.—Coccyzus. Levaillanti, Sw. Zool. Ill. ii. pl. 13.

ERYTHROPHRYS, *Sw.*

Bill as in *Oxylophus*; head not crested; nostrils oval; wings lengthened, pointed, extending beyond the tail covers, the third quill longest, the second much shorter than the fourth; tarsi moderate, naked. Inhabit the new world, and rear their own young.

Type.—Cuculus Carolinensis, Wilson, iv. 23. f. 1.

CHALCITES. *Lesson.*

Bill and general structure as in Cuculus. Plumage metallic green; upper mandible entire; nostrils circular; wings pointed, the third quill longest, the second much longer than the fourth; tarsi very short, almost entirely plumed; rump and upper tail-covers soft. Inhabits the tropics of the old world; parasitic.

Type—Cuculus auratus, Auct. Le Vail. Ois. d'Af. v. pl. 210, 211.

EUDYNAMYS. *Horsf. and Vig.*

Bill strong, thick, the under mandible not curved, and angulated beneath; upper mandible entire; wings pointed, the fourth quill longest; tarsi much shorter than the longest toe; the upper part plumed; rump and tail-covers soft. Inhabits the old world.

Type.—Cuculus orientalis, Auct.

My next memoir upon this family will contain a similar exposition of the remaining divisions, with the specific characters of several new or obscurely known species.

IV.—*Some account of the Comparative Anatomy of two species of the genus Cercocebus, Geoffroy.* By P. C. EYTON, Esq.

I obtained the two monkeys from which the following notes were made, from Mr Wombwell, when his menagerie was at Shrewsbury, in January 1836; where they died while in his possession. The lungs of both, as well as some of the other viscera, were much diseased, the former adhering in both instances to the parietes.

CERCOCEBUS SABÆUS, *Griffiths' Cuvier;* Simia sabæa, *Linn.* Green-Monkey, *Penn.*

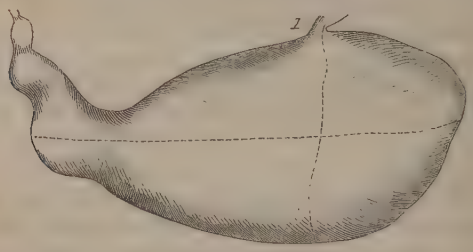
The description of this monkey, which was a male, corresponded precisely with that given in the synopsis of the Mammalia in Griffiths' translation of the "Regne Animal," and also with that in Sir William Jardine's Naturalist's Library. The measurements were as follow: Length from the tip of the nose to the root of the tail, 1 foot $5\frac{1}{2}$ in.; length of the tail, 1 foot 4 in.; length of the intestinal canal from the pylorus to the anus, 14 feet 4 in.; length of the rectum, 3 feet 2 in.:—length of the kidneys, 2 in., greatest diameter, 1 in.:—liver five-lobed:—diameter of the small intestine inflated, 1 in.; above the cœcum, $\frac{3}{4}$ in.; diameter of the rectum, 1 in.; below the cœcum, $1\frac{1}{2}$ in.; length of the cœcum, from the

junction of the small intestine $1\frac{4}{5}$ in. (Fig. 2:)—length of the stomach (Fig. 1) * inflated, $5\frac{1}{2}$ in.; diameter at the junction of the œsophagus, which is the greatest, $3\frac{1}{4}$ in.; length from the œsophagus to cerebral extremity, 2 inches.

Upper jaw, molars 8; incisives 4; canines 2.—Lower jaw. molars 10; incisives 4; canines 2.

The posterior molars in the upper jaw were just making their appearance; in other respects, the dentition agreed with that given of the genus Cercocebus in "F. Cuvier Dents des Mammiferes."

Vertebræ, cer. 7; dor. 12; lum. 8; sac. 2; caud. 20, some of the latter, probably two or three, were wanting.—Ribs, true, 8; false, 4. —Length of ulna, $5\frac{3}{4}$ in., of humerus, $5\frac{9}{10}$ in., of femur, $5\frac{1}{2}$ in., of tibia, $5\frac{1}{2}$ in.



CERCOCEBUS FULIGINOSUS, *Geoffroy.*
White-eyelid Monkey, *Penn.*

The specimen was a young female. The teeth were not all developed, and the white on the eyelids, so remarkable in the adult, was not clear or well defined. In other respects it agreed with the description of authors.

Length from the nose to the root of the tail, 1 foot $3\frac{1}{2}$ in.; length of the tail, 1 foot $6\frac{1}{2}$ in.:—length of the intestinal canal from pylorus to anus, 10 feet 9 in.; length of rectum, 2 feet 9 in.:—diameter of the kidney, 1 in., length 2 in.; liver five-lobed.

In the peritonæum were numerous entozoa, about 30 in number. Diameter of the small intestine 1 in., above the cœcum, $7\frac{1}{10}$ in.; diameter of the rectum, 1 in., below the cœcum, $1\frac{3}{4}$ in; length of cœcum, $1\frac{8}{10}$ in.; length of the stomach (Fig. 4) when inflated, $4\frac{3}{4}$ in.; diameter at the junction of the œsophagus, which is the greatest, $2\frac{3}{4}$ in.; œsophagus inserted about one-third of the whole length from the cardiac extremity. The cœcum, and the adjoining parts

* The dotted lines indicate the direction in which the dimensions have been taken.

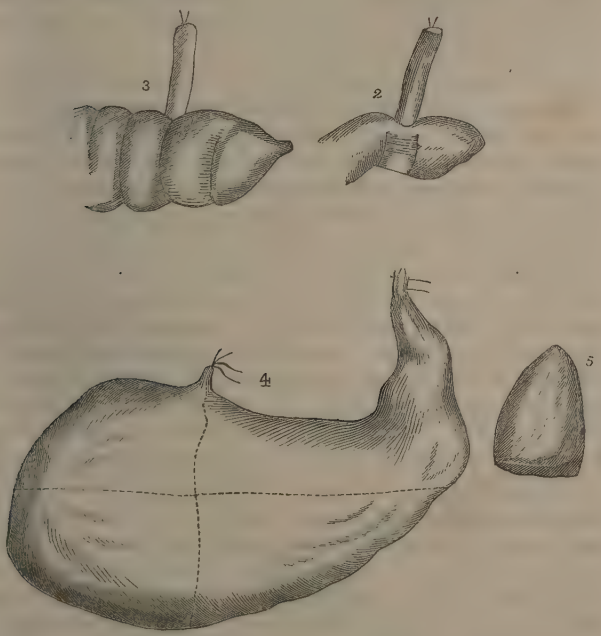
of the rectum in this species present rather a sacculated appearance (Fig. 3.)

Upper jaw, molars, 8; incisives, 2 anterior; canines, 0; milk or first teeth, 2.—Lower jaw, molars, 6; incisives, 2 anterior; canines, 0; milk or first teeth, 4. In the upper and lower jaw the young canines were displacing the two milk teeth adjoining the anterior incisives, the posterior molars were just beginning to appear.

Vertebræ, cer. 7; dor. 11; lum. 7; sac. 3; caud. 23, probably the last caudal vertebra was wanting.—Ribs, 9 true, 3 false.—Length of the ulna 5 in., of humerus $4\frac{2}{10}$ in., of femur 6 in., of tibia $5\frac{1}{2}$ in.

The spleen, in both species, was similar in shape (Fig. 5,) but in C. sabæus rather larger than in C. fuliginosus.

From the above account it will be seen that the stomach is larger in C. sabæus than in C. fuliginosus, the contrary being the case with regard to the Cœca.*



* It will be useful to compare the figures illustrating this paper with those given in the Transactions of the Zool. Society, i. p. 65, plates 8 and 9 of the sacculated stomachs of the Semnopitheci.—Edit.

V.—*The Natural History of British Zoophytes.* By George Johnston, M. D. Fellow of the Royal College of Surgeons of Edinburgh. (Continued from p. 247.)

III.—On the Structure and Formation of the Polypidoms.

The existence of a polypidom is not, as has been already mentioned, essential to a polype; nor does it exercise, when present, that great influence over the organization of its architects and tenants which might have been anticipated. Thus the animal of the madreporous Caryophyllæa does not essentially differ from the naked Actinia; and the gelatinous Hydra is a true representative of the tenant of the sheathed Sertulariadæ and Tubularia. No Ascidian polype, however, is ever found detached, and without a polypidom; and it is the same with all our native Astroida, but, perhaps, the clustered animal-flower (Actinia sociata, *Ellis*, Zoanthus, *Cuv.*) of the Carribæan sea, might take its place in this tribe with greater propriety than in any other.

In reference to their composition, Polypidoms may be divided into 1. the stony or calcareous, 2. the membrano-calcareous, and 3. the horny and flexible; but the line which separates these divisions is often as uncertain and debateable as that which is traced between the sister kingdoms. All are composed of the same materials, viz. lime, and a gelatinous or membranaceous substance; and their peculiar characters depend on the different proportions in which the materials are mixed. The calcareous, which are hard and inflexible, and, when dry, assume a white colour, consist principally of carbonate of lime, with a small quantity of the phosphate of the same earth, and the gelatinous matter which cements them into one coherent mass, is in sparing proportion: that proportion is so greatly increased in the polypidoms of the second section, that when the earthy ingredients have been removed by the action of diluted acids, the structure retains its original form, and is, in fact, reduced to the condition of the polypidoms of the third section, which contain no lime, or very little of it, but are formed of a condensed gelatinous membrane, which resembles horn in every essential property.*

These diversities in their chemical composition appear to be of little value, either in a physiological or systematical point of view, for in every order of polypiferous zoophytes, we find calcareous and horny polypidoms. A curious species of Actinia secretes a horny

* See additional Note, p. 446.

basis, the first rudiment of a madrepore;* but all other madrepores are calcareous: the axis of the Astroida is sometimes of lime, sometimes of horn, and sometimes of membrane: the polypidoms of the Hydroida are flexible and horny in general, and although some calcareous species will be found arranged in this order, yet it must be acknowledged that, as the animals of these species are unknown, or very imperfectly described, the existence of calcareous polypidoms in it is somewhat conjectural; but there is no hesitation in asserting, that the ascidian tribes fabricate productions, some of which are referable to every class that the chemist could devise.

The reader who is not already familiar with the outward forms of our native polypidoms, will most easily obtain a correct idea of them, by examining the figures which will illustrate this work. The very few and insignificant madrepores, or helianthoid polypidoms, which inhabit the British shores, form either short cylinders or reversed cones, having the apex cuped and starred with lamellæ, which radiate from the depressed centre to the circumference. In the major part of the Astroida, or corticiferous polypidoms, there is a central calcareous or horny axis, which may be compared to the wood of a tree, and which is formed by the successive deposition of layer over layer; and this is coated or barked round with a living irritable flesh or jelly, thickened with calcareous matter, which has usually crystallized in the form of spicula. The cells of the polypes are excavated in this soft bark, on the surface of which they open by an aperture, which is always cut into eight rays disposed in a starred fashion, and corresponding to the number of the polype's tentacula; and this aperture can be opened and shut at the pleasure of the inmates. In Alcyonium, although an asteroid, there is no solid axis, but there is an evident tendency to its formation; the materials lie scattered in the form of spicula in the soft gelatinous centre; and in the Cydonium these spicula have become so numerous, that they impart considerable rigidity to the whole mass.

The polypidoms of the Hydraform and Ascidian zoophytes are constructed on very different plans. Were a botanical nomenclature allowable, we might express this difference by saying that those of the asteroid polypes are *exogenous*, seeing they are formed by the

* It has been doubted whether this horny base is formed by the Actinia, but I quite agree with Dr Coldstream, that "it is secreted by its base, and that it is as much part of the animal, in fact its skeleton, as are the calcareous axes of Caryophyllæa, Fungia, &c., between which and the true Actinia, it seems to form a well-marked link." See the Edin. New Phil. Journ. ix. p. 238.

deposition of layer over layer, secreted from without; while those of the tribes in question are *endogenous*, and receive all their increment in thickness, from secretions deposited from within. When the material is calcareous or membrano-calcareous, it is moulded into cells or short tubes, which are placed generally in apposition, and in one or two layers or series, and arranged in straight rows in a very regular manner, so that every cell alternates with the one at its side. This arrangement is very obvious in the Flustræ, but it is not less real in Cellepora and Eschara, in which, by the cells being immersed, it is partly concealed. When, on the contrary, the material is horny, it is formed into tubular sheaths encasing the living flesh, jointed at intervals, sometimes of the same calibre throughout, but more commonly dilated at intervals into vases or cups, or cells, in which the proper body of the polype is placed. The manner in which the sheath or tube is divided and branched, is limited in diversity only by the number of the species, which are among the most delicate and interesting of all polypidoms, and pre-eminently imitative of vegetable forms. These forms are of course altogether independent of their animated tenants,—these "have been specifically appointed by Him to do what they have done, and are still effectuating. They are mere instrumentalities at His command. They know nothing of the results they cause, nor mean to perform any of them, nor could of themselves co-operate with each other, nor produce any systematical arrangement, or regulated or orderly effects. It is their Master and Maker who organizes, governs, and guides them to those movements and operations which they perform, and from all others; so that by His directing will they are made to do what we see them effect, and that only, because He restrains and averts them from all else." *

The formation of polypidoms has been the subject of considerable discussion. The opinion of Ellis, as we have already seen, was, that they are the result solely of a transudation, or excretion of the constituent matters from the body of the polypes, and this opinion has been maintained recently by Lamarck, and some other naturalists. It rests on the assumption that the polypidom is extravascular and inorganic, so that after its first solidification, it suffers no alteration in form and quality, beyond what is evidently effected by the operation of chemical and mechanical causes: the changes resulting from its increase in size, are not from the activity and pulsion of any inherent principle, but from the super-imposition of additional layers, or from the additions of new cells, or from the pro-

* Turner's Sac. Hist. of the World, Vol. ii. p. 71.

longation of the tubes, which additions are all coetaneous with the growth and multiplication of the polypes, and the results of new secretions. Linnæus, Pallas, and Baster opposed Ellis, and believed in a vegetative principle, inherent in the polypidom itself, so that its growth was in some measure independent of the living tenant; and various arguments have been brought forward by Bory de St Vincent, which appear to him to demonstrate the truth of this doctrine.

Let us forget their reasonings, and take a concise review of the facts. The polypes of Pennatula and Alcyonium occupy cells, which are, as it were, immersed in a pulpous mass, containing a considerable quantity of calcareous spicula, and which appears to be living and organized; for if the naked stem of the Pennatula, or the surface of the Lobularia is irritated, a slow gradual contraction of the whole polypidom apparently proves that the irritation has been felt throughout; and if left undisturbed for a time, the polypidom will be again distended, until its bulk exceeds by two or three times its dimensions in the collapsed state; the increase in size being produced by the introduction of water into the interior, and which has percolated, as has been shown, through the stomach and vasculiform appendages of the polypes. The crust or bark of the Gorgoniæ is identical in structure with the Alcyonium, and, like it, also a living part, capable of converting nutriment to its own nature, of repairing injuries and losses, and of forming new parts; but so far from having anything in common—any affinity with the proper polypidoms of the Hydroida and Ascidioda, this crust is in fact identical with the medullary pulp of the latter, and the very source of what Ellis and Lamarck would consider the inorganic polypidom.* For it is to be observed, that in the Asteroid (which includes Pennatula, Alcyonium and Gorgonia) the polypes and their medium of union are external or cortical; there is strictly speaking no polypidom, but the part which a strict analogy teaches us to call so, is the central solid axis which gives form and firmness to the structure. Now, when we trace the formation of this axis through the various genera, from its first appearance in the form of scattered crystalline spicula, until it graduates into a solid continuous rod, we can scarcely doubt its inorganic and extravascular character; it is the

* Bosc takes a different, and a strangely erroneous view: He conjectures that the polypes of these polypidoms may have excretory pores of two kinds,—one kind situated at the posterior part of the animal, to give exit to the juice which is converted into the horny axis; the other kind placed in the collar to excrete the cretaceous or spongoid bark.—Vers, ii. 226.

crystallization of calcareous matter excreted by the living polypiferous bark, and once excreted, beyond their power to change it, excepting by the addition of material of the same quality. And to confirm this inference, anatomy lends its aid, for no structure of vessels or of cells in which fluids could circulate, can be detected in the axis; nor can any vessel be shown which can maintain a connection between it and the living pulp.

There are certain discrepancies which might render it doubtful how far the same theory can be safely applied to explain the formation of the polypidoms of the Hydraform and Ascidian polypes: the axis of the corticiferous species is internal,—the polypidoms of the latter are always external; the former is solid,—the latter are tubular sheaths or cells, and occupied with the polypes, or with the living pulp, of which the polypes are merely a developement. But the new position and form of these polypidoms has not altered their real nature, for, as in the preceding, their texture is homogeneous, like horn or shell, in which no vascular or cellular structure, similar to that of organs growing by imbibition and assimilation, can be detected, nor can they be made to evince a sign of the lowest irritability by the application of any stimulus. And further, between the polypes, and their sheath or cells, there is no organical connection, and even no very close apposition in the hydracolous tribe, so that when the polype moves in its cell—whether to retreat within its cavity or expand itself beyond the rim—the cell suffers no change or alteration in shape or capacity; it remains, under all the mutations of the lively and protæan inmate, invariably the same.

Seeing, then, that they are undoubtedly extravascular, the necessary inference seems to be, that the polypidoms in question cannot grow as a plant grows, but must be evolved from and moulded on a living basis,—and can be no other than an exudation from the surface of the living flesh: and, accordingly, it has been ascertained by experiment, that if this fleshy substance is destroyed, no horny sheath or skeleton is formed. In the reproductive gemmule there are two substances, viz. the pulp and the thin cuticle or membrane, the latter of which is the germ of the future arborescent or cellular polypidom: by the growth of the pulp the membrane is distended and moulded into a cell, or pushed upwards in the form of a shoot, in which, after a time, the pulp is arrested in its growth longitudinally, and swells out, and is developed into an animated polype, furnished with tentacula, and with a mouth and digestive organs. Bursting the cell at the point which becomes the future aperture,

it there displays its organs, and begins the capture of its prey ;* for, unlike higher organisms, the polype is at this the period of its birth as large and as perfect as it ever is at any subsequent period, the walls of the cell having become indurated and unyielding, and setting a limit to any further increase in bulk. The growth being thus hindered in that direction, the pulp, incessantly increased by new additions of nutriment from the polype, is constrained and forced into its original direction, so that the extremities of the cell or tube, which have remained soft and pliant, are pushed onwards, the downward shoot becoming a root-like fibre, and the upper continuing the polypidom, and swelling out as before, at stated intervals, into cells for the new developement of other polypes ; and just as the fleshy substance extends in either direction, upwards or horizontally, it exudes from its surface " a liquid albuminous matter, —at first soft and transparent, but which after a short time becomes consolidated, and, in proportion to the time it remains, becomes more and more dense." The polypidom then, however like unto certain vegetables in appearance, has, as Ellis said, nothing vegetable about it, but is entirely an animal production, and excreted by the animated pulp which fills its whole interior. Ellis and his followers are only so far wrong, that they have attributed to the polypes themselves what is actually due to the pulp, whether medullary or cortical. The latter is that from which the polypidom is exuded ; for, indeed, the cell or crust always precedes the existence of the polypus which is developed within it, while the polypidom is developed from the gelatinous substance of the reproductive gemmules before any polypes begin to be formed, and it continues to be developed and extended by the fleshy mass of the zoophyte, whether polypes are developed in the cells or not. " There is but one life, and one plan of developement, in the whole mass ; and this depends not on the polypi, which are but secondary and often deciduous parts, but on the general fleshy substance of the body." †

* " The cell," says Lamouroux, speaking of the Flustra, " is yet closed, but through the transparent membrane that covers its surface, the movements of a polypus may be perceived, who delays not to burst the enclosure of his little habitation ; then, exulting in the plenitude of existence, he exercises its functions, and by the assistance of twelve tentacula that surround his mouth, he gives a rotatory motion to the water, and involves in this diminutive whirlpool the animals on which he feeds."—Corall, p. 43.

† Grant's Outlines of Comp. Anatomy, p. 14.—We take the opportunity of recommending this valuable work to every student of natural history.

Additional Note.

The only extensive series of experiments we have on the composition of Polypidoms are those of Mr Hatchett, published in the Philosophical Transactions for 1800, and the subsequent progress of zoological and chemical science requires a new investigation of the subject. The general results of Mr Hatchett's experiments are, "that the Madrepores and Millepores are formed of a gelatinous or membranaceous substance, hardened by carbonate of lime, the difference consisting only in the mode in which these materials are combined: that in the Tubipora, Flustra and Corrallina, some phosphate of lime is mixed with the carbonate of lime: that in the Isis the basis is a regularly organized membranaceous, cartilaginous and horny substance, hardened by carbonate of lime, one species only (the Isis ochracea) yielding also a small proportion of phosphate of lime. That the hardening substance of the Gorgonia nobilis is likewise the carbonate of lime, with a small portion of phosphate; but that the matter forming the membranaceous basis consists of two parts, the interior being gelatinous, and the external a complete membrane, so formed as to cover the stem in the manner of a sheath or tube. That the other Gorgoniæ consist of a horny stem coated by a membrane, which is hardened by carbonate of lime. That the sponges are of a nature similar to the horny stems of the Gorgoniæ, and only differ from these and from each other by the quality of texture. And lastly, that the Alcyonia are likewise composed of a soft flexible membranaceous substance, very similar to the cortical part of some of the Gorgoniæ; and in like manner slightly hardened by carbonate, mixed with a small portion of phosphate of lime.

"From this mass of evidence we collect, in general, that the varieties of bone, shell, coral, and the numerous tribe of Zoophytes with which the last are connected, only differ in composition by the nature and quantity of the hardening or ossifying principle, and by the state of the substance with which this principle is mixed or connected; the gluten, or jelly, which cements the particles of carbonate or phosphate of lime, and the membrane, cartilage, or horny substance which serves as a basis, appearing to be only modifications of the same substance, which progressively graduates from a viscid liquid, or gluten, into a gelatinous substance, which again, by increased inspissation, and by the more or less perfect degrees of organic arrangement, forms the varieties of membrane, cartilage, and horn, which, it seems, form the peculiar differences of the several species." Abst. Phil. Trans. i. 25–26. There is a very full analysis of Hatchett's paper in Thomson's Syst. of Chem. v. p. 559, et seq. The paper itself will be found in Phil. Trans. abridg. xviii. p. 706.

IV. The British Zoophytes, divided into four Orders.

From what has been said in the preceding chapters, it seems to follow that the Polypidom, considered by itself, will prove a fallacious guide in any attempt to classify Zoophytes, if it is wished that that classification (and other classification we hold next to valueless) should give a correct representation of the structure of the animated tenants, and distribute these into groups characterized by a uniformity in the leading traits of their anatomy. It is true, that La-

mouroux and Lamarck entertained a very different opinion. The former, with feigned regret of the hopelessness of an anatomical method, and with a conviction of its inapplicability if attained, proceeded to arrange and subdivide the class on the ground of differences in the chemical composition of the polypidoms; and the latter, assuming that their cells and corals were an exact cast or mould of the features of the polypes, and hence that a sameness in the structure and form of the one necessarily implied a correspondency in the structure of the other, invented a system which he has, with a complacency that is almost ludicrous, pronounced to be in exact harmony with the march of nature in her creations, or, to use a language more becoming us, with that plan upon which the Author of Nature has apparently proceeded in calling his creatures into existence. We shall analyze these systems hereafter: it is at present sufficient to say, that the result of their labours has been a very preposterous combination of species and genera,—separating, in many cases, what is nearly affined, and, in other instances, assorting together what are most alien. There is indeed no safer course for the systematist than that pointed out more especially by Blainville: the anatomy of the polypes must be the basis of his primary divisions, while in the composition of the polypidoms he may possibly find characters to discriminate and circumscribe the secondary groups in the absence of that more certain knowledge which the comparative anatomist has yet failed to give him. On this principle we now attempt to classify the British Zoophytes, which it is proposed to divide, in the first place, into the following sub-classes and orders. *

Sub-class I. Radiated Zoophytes.

Body contractile in every part, symmetrical; mouth and anus one; always gemmiparous?

Order I. Hydroida. *Polypes* compound, rarely single and naked, the mouth encircled with roughish filiform tentacula; stomach without proper parietes; intestine 0; anus 0; reproductive gemmules pullulating from the body and naked, or contained in external vesicles. *Polypidoms* horny, fistular, more or less phytoidal, fixed, external. Marine, excepting *Hydra*, which is lacustrine.

Order II. Asteroida. *Polypes* compound, the mouth encircled with 8 fringed tentacula; stomach membranous, with dependant vasculiform appendages; intestine 0; anus 0; reproductive gemmules produced interiorly. *Polype-mass* variable in form, free or

* The classification indicated by Audouin and Milne-Edwards seems in exact harmony with the one here adopted. Recherches pour servir à l'Histoire Nat. du Littoral de la France, Vol. i. p. 73—6.

permanently attached, carnose, generally strengthened with a horny or calcareous *axis* enveloped with the gelatinous or creto-gelatinous crust in which the polype-cells are immersed, and which open on the surface in a starred fashion with eight rays. Marine.

Order III. Helianthoida. *Polypes* single, free or permanently attached, fleshy, naked or encrusted with a calcareous *Polypidom*, the upper surface of which is crossed with radiating lamellæ; mouth encircled with tubulous tentacula; stomach membranous, plaited; intestine 0; anus 0; ovaries in thread-like bundles, internal. Marine.

Sub-class II. Molluscan Zoophytes.

Body non-contractile, and non-symmetrical; mouth and anus separate; always oviparous?

Order IV. Ascidioida. *Polypes* aggregate, the mouth encircled with filiform ciliated retractile tentacula; a distinct stomach, with a curved intestine terminating in an anus near the mouth; ova internal. *Polypidoms* very variable,—either horny, fistular and confervoid, or calcareous, membranous, or fibro-gelatinous, formed of cells connected and arranged in a determinate and usually quincuncial manner. Marine and lacustrine.

To be continued.

VI.—*Notes on the Hawfinch (Coccothraustes vulgaris, Cuv.) as observed in the vicinity of Epping Forest.* By Henry Doubleday, Esq.

By nearly all our writers on ornithology, the Hawfinch has been considered as only a visitor of the British Islands, and these visits have been supposed to be confined to the winter season, and to occur at rather uncertain periods.

Situate in a locality where these birds abound, I have for some years past given close attention to their habits, and I can safely assert, that they are permanent residents, nor can I perceive any addition to their numbers by the arrival of foreigners at any period of the year.

Their extreme shyness has no doubt contributed to keep us in ignorance of their habits and economy: in this trait they exceed almost any land bird with which I am acquainted, and in open places it it almost impossible to approach them within gunshot.

Their principal food here appears to be the seed of the Hornbeam (*Carpinus betula*, Linn.) which is the prevailing species of tree in Epping forest; they also feed on the kernels of the haws, plum-

stones, laurel-berries, &c. and in summer make great havoc amongst green peas in gardens in the vicinity of the forest.

About the middle of April they pair, and in a week or two commence nidification. The situation of the nest is various, but is most commonly placed in an old scrubby whitethorn bush, often in a very exposed situation; they also frequently build on the horizontal arms of large oaks, the heads of pollard hornbeams, in hollies, and occasionally in fir trees in plantations, the elevation of the nest varying from five to twenty-five or thirty feet.

The most correct description of the nest which I have seen is in Latham's Synopsis. It is there said to be composed of the dead twigs of oak, honeysuckle, &c. intermixed with pieces of grey lichen; the quantity of this last material varies much in different nests, but it is never absent: in some it is only very sparingly placed among the twigs, in others, the greater part of the nest is composed of it; the lining consists of fine roots and a little hair.

The whole fabric is very loosely put together, and it requires considerable care to remove it from its situation uninjured.

The eggs vary in number from four to six, and are of a pale olive green, spotted with black, and irregularly streaked with dusky. Some specimens are far less marked than others, and I have seen some of a uniform pale green.

The young are hatched about the third week in May, and as soon as they are able to provide for themselves, they unite with the old birds, in flocks varying in numbers from fifteen or twenty to one or even two hundred individuals.

In this manner they remain through the winter, feeding on the hornbeam seeds which have fallen to the ground, and only separate at the approach of the breeding season.

I believe the male has no song worth notice: in warm days in March I have heard them, when a number have been sitting together on a tree, uttering a few notes in a soft tone, bearing some resemblance to those of the bullfinch.

The plumage of the young bears considerable resemblance to that of the young Greenfinch: the throat is bright yellow; head, neck, and upper parts olive-brown; the under parts paler, each feather tipped with brown.

In winter the bill is a pinkish horn-colour, but becomes deep blue in the breeding season.

Although so common in this neighbourhood, the hawfinch is but little known, which is to be attributed to its shy and retired habits, and I have little doubt it is found in most parts of the kingdom

where the hornbeam is abundant.* In this vicinity it seems rapidly increasing, and will probably ere long be equally common with its ally the Greenfinch.

VII.—*On Hybrids produced in a Wild State between the Black-Grouse (Tetrao tetrix,) and Common Pheasant (Phasianus Colchicus.)* By William Thompson, Esq. Vice-President of the Belfast Natural History Society.†

Having lately heard that a hybrid bird, bred between the common pheasant (Phasianus Colchicus, Linn.) and black grouse (Tetrao tetrix, Linn.) had been shot in Wigtonshire, and was preserved for Sir Andrew Agnew, Bart., M. P., through the medium of our mutual friend, Captain Foyrer, R. N., I proposed a few queries respecting it. Sir Andrew, on receiving these, thought an examination of the specimen would prove more satisfactory than a mere reply, and, with the kindest consideration, sent the bird from Lochnaw Castle for my inspection. He states that it was shot in the autumn of 1835 in a wild state at Lochnaw, where it had been seen several times on the wing by persons who imagined it to be a wild turkey. Pheasants and black grouse are numerous in the surrounding plantations; but this is the only bird of the kind that has been observed.

In four instances only am I aware of similar hybrids being recorded. The first is mentioned in White's History of Selborne as a curious bird, shot in a coppice at the Holt, and sent by Lord Stawell for his inspection. Its parentage was not rightly conjectured by Mr White, nor even by several later authors who have endeavoured from his description to make it out. In a note, however, to p. 344 of a late edition of this work (8vo ed. 1833), the Hon. and Rev. William Herbert mentions having seen the specimen in the collection of the Earl of Egremont at Petworth, and speaks decisively to its true parentage. The second specimen was exhibited at a meeting of the Zoological Society of London on the 24th of June 1834, by Joseph Sabine, Esq. who stated that it was bred in Cornwall.‡ The third, shot near Merrington, in Shropshire, was announced to the same Society on the 12th of May 1835, by T. C. Eyton, Esq. by whom it was described in some detail.§ In the preface to a subsequent

* This is not the case, nor is it a natural consequence to the abundance of the Hornbeam.

† Read before this Society on Dec. 7, 1836, when the specimen from the collection of Sir A. Agnew, Bart. was exhibited.

‡ Proc. Zool. Soc. 1834, p. 52. § Ibid. 1835, p. 62.

publication, ("History of the Rarer Species of British Birds,") Mr Eyton informs us, that the brood to which this bird belonged consisted of five individuals, all of which were killed, though two only are preserved. In the same work, (p. 101,) the fourth, and last I know to be on record, is mentioned as having been obtained near Corwen, in Wales, and is in the possession of Sir Rowland Hill, Bart.

There is not any notice of similar hybrids in the continental works which I have had an opportunity of consulting, and as Temminck is silent on the subject in his comprehensive publications, Histoire Naturelle Générale des Pigeons et des Gallinacés, and Manuel d'Ornithologie de l'Europe, such birds have most probably never been met with on the continent of Europe.

Mr White's description, with the exception of the "legs" being "bare of feathers" applies admirably to the present specimen. He observes, "The shape, air, and habit of the bird, and the scarlet ring round the eyes, agreed well with the appearance of a cock pheasant, but then the head and neck, and breast, and belly, were of a glossy black; and though it weighed 3lb. 3½oz., the weight of a large full-grown cock pheasant,* yet there were no signs of any spurs on the legs, as is usual with all grown cock pheasants, who have long ones. * * In the tail were no long bending feathers, such as cock pheasants usually have, and are characteristic of the sex. The tail was much shorter than that of a hen pheasant, and blunt and square at the end. The back, wing-feathers, and tail were all of a pale russet, curiously streaked." With the little that is related of Mr Sabine's bird, the present individual agrees, but differs much both in colour and dimensions from Mr Eyton's specimen. This latter is a female; the one under consideration is presumed to be a male. In the following table its dimensions are contrasted with those of the cock pheasant and black-cock.

	Black Cock.		*Hybrid.*		*Cock Pheasant.*	
	In.	*Lines.*	*In.*	*Lines.*	*In.*	*Lines.*
Length, (total.) . .	20	†0	25	3	34	0
——— of tail, . . .			9	0	19	0
——— wing from carpus to end of longest quill,	9	9	10	3	9	9
——— bill above to first feathers on ridge, . .	0	8	1	1	1	0

* Though the weight of the present specimen cannot now be determined, the size of the body, it may be remarked, is equal to that of the cock pheasant.

† To centre of tail.

	Black Cock.		*Hybrid*		*Cock Pheasant.*	
	In.	*Lines.*	*In.*	*Lines.*	*In.*	*Lines.*
Length of bill to rictus,	1	2	1	5	1	4
——— tarsus,	2	2	3	1	3	1
——— middle toe,	1	10	2	0	1	11
——— to nail,	0	8	0	7	0	7
——— hind toe,	0	5	0	7	0	8
——— to nail,	0	4½	0	4	0	4

Fourth quill longest in hybrid and black-grouse; 3d, 4th, and 5th equal in pheasant.* Tail of hybrid extending 5½ inches beyond closed wing, rounded on expansion, containing 17 feathers, all but the longest being regularly matched, it has probably lost one; 18 is the number both in the pheasant and black-grouse. Bill in form differing only from the pheasant in having the upper mandible less arched. Tarsi and toes in form like the pheasant, but having many more plates; tarsi, bare on the sides and behind, but feathered in front for half their length. Naked skin about the eye equalling in extent the pheasant's, but differing in form both from it and the black-cock's merely appearing in advance of the eye, but broadening out to the extent of half an inch just behind it. There is none above the eye as in the latter bird. Form of the feathers on the head, neck, breast, back, belly, and under tail-coverts, intermediate between the two species; of the scapulars and wings approximating to those of the black grouse. The quills are similar,—those of the tail unlike either species.

In *colour* the hybrid has head, neck, breast, and belly black, each feather when viewed in the light, terminating in a band of a rich claret colour tinged with gold, which decreases in breadth downwards, until at the lower part of the belly it disappears. On laying back the breast feathers, the inner ones exhibit about an inch or less from the tip, a somewhat semicircular band of a cream colour; the inner feathers at upper part of the back similarly examined, shew the cream-coloured marking of the pheasant, the remainder of the feather black, terminating in a claret colour. Upper part of the back, wings, and tail, not resembling either sex of black-grouse or pheasant, but have a soft blending of grey, brownish-yellow, and black, beautifully undulated; quills differing only from the black-cock's in the shafts being blackish-brown. Tail-feathers obscurely undulated with black and brownish-yellow, and transversely barred with black, the bars on the outer feathers occupying as much space as the mottled plumage, their tips black for about 1½ inches; this colour gradually lessens towards the central feathers, the five longest being

* By pheasant the male bird is meant throughout, when not otherwise expressed.

mottled at their extremities. These present a singular reverse to the longest tail feathers of the pheasant, in which the bars become broader as they approach the end, but in this bird altogether disappear there. Some of the feathers on the wing-coverts have the shaft cream-coloured, with the centre black, ending in a point towards the tip, as in the pheasant; but the cream-coloured band surrounding it in that bird is wanting, and the extremity of the feather is mottled. The lower part of the back and rump has a blending in about equal quantity of black and mottled plumage, each feather terminating in claret colour. The only white in the plumage is a spot on the shoulders similar to that exhibited by both sexes of the black grouse, and a few of the vent feathers partially displaying it. Under tail-coverts black, mottled with rich reddish-brown at their tips. Bill intermediate between the greenish-horny colour of the pheasant and the black of the Tetrao tetrix. Tarsi and toes also intermediate.

Mr Sabine and Mr Eyton describe their hybrids as bred between the cock pheasant and grey-hen, but that the produce is as likely to occur from the opposite sexes of these species, is indicated by the following circumstance: A black-cock, a few years since, in the possession of my friend, William Sinclaire, Esq. of Belfast, having been kept along with a cock and two hen pheasants, beat and drove away the cock whenever he approached the hens in spring, and, as a brood of pheasants was wanted, had to be removed to another enclosure. This black-cock at the same time displayed towards these hen pheasants all the attitudes by which, in a wild state, the attention of the females of his own species is attracted, and his love-call, so loud as to be heard at a great distance, was almost incessantly uttered. He was a bird of the previous year, taken in autumn by John Sinclaire, Esq. on his shooting-grounds in Ayrshire, after having been "put in" by one of his trained peregrine falcons.

VIII.—*Characters and Descriptions of the Dipterous Insects indigenous to Britain.* By James Duncan, M. W. S., &c. &c. (Continued from p. 368.)

Genus CHRYSOPS, *Meig.*

Antennæ longer than the head, projecting horizontally, somewhat curved upwards at the tip; three-jointed, the two lowest joints

cylindrical, equal, and pubescent, third elongate and tapering, divided into many rings, the four near the apex being generally most distinct, (Fig. 1.); palpi pubescent, the first joint short, second long, and somewhat conical in both sexes, (Fig. 3, *c*) ; proboscis horizontal in the male, vertical in the female, rather slender, the terminal lobes elongated ; labrum long and pointed (Fig. 3, *a*.) ; eyes golden green, with spots and bands of purple ; ocelli three ; tibiæ terminating in two minute spines ; wings half open when at rest, the anal cell scarcely closed at the inner margin.

Besides several attributes peculiar to itself, the genus Chrysops (so named on account of the brilliancy of the eyes,) combines some of the separate characters of the preceding and following genera, and thus forms a connecting link between them. Its affinity, however, to Hæmatopota is much greater than to Tabanus, as it possesses, in common with the former, cylindrical antennæ, palpi nearly alike in both sexes, and spines at the extremity of the tibiæ, besides presenting some other minor points of agreement. Its most striking peculiarities are, the annulated appearance of the whole of the terminal joint of the antennæ, the presence of ocelli, and the obscure coloration of the wings, relieved by a few transparent pale-coloured patches. About a dozen species are known to inhabit Europe, but of these a very small proportion occur in Britain. In habits they are similar to the Tabani, and the larvæ, like those of the group just named, are said to live in the earth ; but this fact comprises all that is known in relation to their early condition.

Chrysops cæcutiens. (s.)

Meig. Latr. Macquart, Steph.—Tabanus cæcutiens, *Linn. De Geer*, vi. 224. pl. 13, fig. 3. *Donovan*, iv. pl. 131.

Male : black and pubescent ; hypostome yellow, but the ground colour almost concealed by two large shining black spots ; eyes with two dark-purple bands, the uppermost interrupted ; forehead black : thorax with reddish-yellow pubescence on the sides ; abdomen black, the second segment with a fulvous spot on each side ; under side dark brown, the two first segments yellow, with a brown central streak : legs black ; wings brownish-black, with a small hyaline spot near the middle, at the side of the discoidal cell, a light-coloured

triangular spot before the apex, and a streak of the same near the base.

Female: hypostome and forehead greyish-yellow, each of them with two shining black glabrous callosities; antennæ and palpi black; the radical joint of the former inclining to fulvous at the base; eyes golden-green, changing with the light, and marked with several angular spots of purple; thorax shining black, clothed with reddish-yellow hairs, particularly on the sides, and having two faint abbreviated grey lines in front: abdomen with the first segment black, having a yellow spot on each side; second yellow, with two diverging black lines in the middle, enclosing a triangular yellow spot; remainder black with yellow hairs: halteres and legs black, the basal joint of the hinder tarsi obscure red; wings brownish-black, with a large pale hyaline spot at the base, not reaching the anterior margin, and another at the apex. 4—4½ lines (Fig. 2.)

The above description applies to the most ordinary states of this fly, but it is one of the kinds which appear in a great variety of aspects. In the state most widely removed from the above, it is of small size (3½ lines,) clothed with long pubescence, especially on the hypostome and two lower joints of the antennæ, and the colour *entirely black*, the pubescence on the belly alone inclining to ferruginous. Several intermediate varieties occur, connecting these two extremes, a circumstance which disinclines us to regard any of them as specifically distinct. These varieties are almost exclusively males, the characters of the other sex being much more constant. To some of them may be referred the insects described under the names of Chry. lugubris and viduatus, Fab., C. consimilis, Steph. &c.

The females of this pretty fly are of occasional occurrence seemingly in all parts of Britain, and in many parts of England they may be regarded as common. The males are comparatively seldom met with, and both sexes become scarcer as we advance northwards. Of the black variety we have seen only one or two examples, males, which were taken in Sutherlandshire and in the south of Scotland. "Cambridgeshire, males rare," *Rev. Leonard Jenyns.* "Stocton-upon-Tees, Cambridge," *Charles C. Babington, Esq.* "Wittlesea Mere, &c. &c." *T. C. Dale, Esq.* "Dumfries-shire, vicinity of Jardine Hall, common." *Sir William Jardine, Bart.*

Chrysops relictus.

Chrys. viduatus, *Fallen. Meig. Klass.* tab. ix. fig. 12. Tabanus cæcutiens, *Panz. Fauna Germ.* xiii. 24. Tab. nubilosus, *Harris Expos.* pl. vii. fig. 5.

About the size of the preceding species, or somewhat larger: hypostome and forehead yellow, with black spots, as in *C. cæcutiens;*

antennæ black, with the base yellow; palpi testaceous: thorax and scutellum greyish, the former with three black lines on the back, and the sides yellow: abdomen yellow, the first segment black in the centre, the second with two connivent black spots of a triangular shape, the remainder black, with a yellow posterior border, which is dilated in the middle and on the sides; under side dull yellow, the base of the segments suffused with brown: thighs dark brown; tibiæ rufous, the anterior with the upper half brown; tarsi likewise rufous, the whole of the anterior pair and the apex of the joints in the rest dusky.

Rather a scarce species, at least in the more northern parts of the country; it is common in the north of France, and will probably not be rare in some of the southern counties of England. "Occurs in Cambridgeshire, but is much less common than *C. cœcutiens*." *Rev. Leonard Jenyns.* "Cambridge," *Charles C. Babington, Esq.* "Near London," *Stephens's Catal.* "Ireland." *A. H. Haliday, Esq.*

Chrysops pictus.

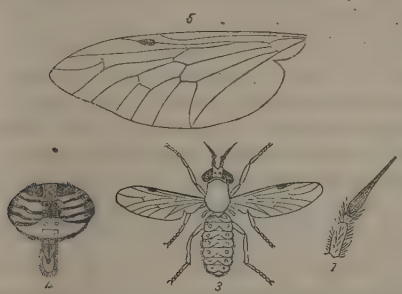
Meig. Zwei. ii. 70. *Macquart*, Dip. du Nord de la France, 166.—Chry. viduatus, Var. *Meig. Klass.* i. 158, 2.

Very similar to the foregoing, but differing in several important characters. Hypostome and forehead greyish-white, with several glabrous black spots, as in the other species; palpi and antennæ testaceous; the terminal joint of the latter dusky, except at the base: thorax shining black, with three longitudinal greyish lines, the sides reddish; scutellum black: abdomen with the first segment yellow on the sides, and black round the scutellum; the second yellow, with a small triangular, or rather slightly lunate black spot on its middle; third yellow, with a transverse black fascia broadest towards the middle, but having its centre emarginate behind; the remaining segments black, with the hinder margin yellow: legs yellow, the thighs and last joints of the tarsi black. The wings do not differ much from those of *C. cœcutiens*, but the dark clouds are less opaque, particularly the apical one, and not covering so much of the wing. $4\frac{1}{2}$ lines.

For a notice of this species, which we have now the pleasure to describe, for the first time, as a British insect, we are indebted to Charles C. Babington, Esq. who met with it in Monkswood, Hunts, June 23, 1829. The above description applies to the female only, the other sex does not appear to have hitherto been noticed by entomologists.

Genus HÆMATOPOTA, *Meig.*

Antennæ longer than the head, radical joint rather long and pubescent, elliptical in the males, subcylindrical in the females; second joint short, cup-shaped, and pubescent; third naked, elongate and tapering, divided into four rings, the first of which is longer than all the rest taken together, (Fig. 1;) palpi two-jointed and pubescent; first joint short, second long and conical; labrum narrow and pointed, nearly as long as the labium; hypostome with an impressed cross line just beneath the antennæ, and a vertical one on each side; eyes of the male meeting above, the forehead of the female very wide, (Fig. 4;) ocelli wanting; thorax with a cross suture interrupted in the middle; abdomen somewhat conical in the male; winglets small, not covering the halteres; tibiæ in the intermediate pair of legs, with two small spines at the tip; wings lying along the body, and forming a kind of roof over it; second submarginal cell, with the rudiment of a nerve at the base; the anal cell extending to the inner edge, (Fig. 5.)



The port of the wings, and their speckled appearance, distinguish these insects at first sight from the rest of the Tabanidæ. Very few kinds are known, and it is even probable that some of those now regarded as species, are not entitled to such a distinction. The females are even more blood-thirsty than the rest of their tribe, and are often extremely troublesome both to men and cattle, particularly in warm showery weather, a circumstance which has caused the name *pluvialis* to be applied the most common species. The males are seldom seen, and their numbers seem to be remarkably few in proportion to those of the other sex. They appear to subsist entirely on the juices of flowers, and in conformity with their innoxious habits, the oral organs are found to be much less developed than in the female. The natural history of these insects in their early states is unknown. Fabricius states that the larvæ live in dung.

Hæmatopota pluvialis (s.)

Tabanus pluvialis, *Linn. Fabr. De Geer*, tab. 13, fig. 1, 2. Hæmat. pluvialis, *Meig. Latr. Fallen.— Reaumur*, iv. pl. 18, fig. 1. Tab. hyeomantis ♂ *Shrank.*

Female: eyes green, with transverse undulating purple-brown

bands; antennæ black, the base of the terminal joint sometimes yellowish, the two lower joints not very hairy, and varying somewhat in their relative proportions:* palpi and hypostome light ash-grey, the latter with black points at the sides, and four remote black spots towards the middle, two of them deeply impressed, and placed at the lower end of the vertical line; forehead grey, with a smooth shining-black space just over the antennæ, two velvety-black rounded spots behind it, and a smaller one in the middle; the latter sometimes obsolete: thorax blackish-brown, with greyish-white longitudinal lines, some of them having a whitish spot near the middle; sides of the breast ash-grey, hairy: abdomen dark brown, the hinder margin of the segments, a dorsal line, and a series of faint spots on each side, light grey; on each segment, beside the lateral spots, there is a short oblique line of small impressed points: under side brownish-grey; thighs grey; tibiæ black, reddish-yellow at the base in the anterior legs, and encircled with two broad rings of that colour in the others; tarsi black, the radical joint reddish-yellow at the base, except in the fore-legs: halteres yellowish-white, the knob with a brown spot: wings greyish-brown, with a dark stigmatic spot, the surface variegated with numerous whitish spots and undulating lines, many of them circular, and one of them forming a short transverse band near the apex. (*Fig.* 3.)

Male: eyes greyish-green, the lower part purplish-brown, with undulating yellowish lines: forehead consisting of a small triangular space, on which there is a callosity, and a grey dot: thorax and abdomen with similar markings to those of the female, the three first segments of the abdomen spotted at the outer side with tawny yellow.

This insect occurs in great plenty throughout Britain and Ireland. In Scotland it is called the *Cleg*, or *Gleg*, a term derived from the Danish word *klaeg*. It is by far the most troublesome of the Tabanidæ, both on account of its numbers, and its persevering and incessant attacks. The great variations in the proportions of the joints of the antennæ, have been thought to indicate distinction of species, and several have accordingly been established. But this circumstance alone is obviously insufficient, in this instance, to be assumed as a satisfactory proof of specific difference, for the variations seem to be almost without end. Thus, the *H. equorum* of

* The radical joint has frequently a constriction towards the apex, sometimes so strongly marked as to present the appearance of a separate articulation. It was no doubt this circumstance that deceived Reaumur, and led him to represent the antennae as 4-jointed.—See Vol. iv. pl. 18, fig. 2.

Fab. has assigned as its characters the thickness of the lower joints of the antennæ, with the addition, "nigricans, abdominis segmentis tribus anticis lateribus rufis, alis albo-punctatis;" properties which are common to nearly all the males of *H. pluvialis*. A small and dark-coloured variety has been named by Mr Curtis *H. hirsuta*, in regard to which, however, it is worthy of remark, that both sexes have occurred, a female having been taken by Mr Dale near Loch Rannoch in July 1825. *H. Italica*, figured by Mr Curtis, from its superior size, looks more distinct; it was taken at Southend, Mersey Isle, Essex, by Mr Churchill. Numerous other modifications in the appearance of this fly might be mentioned; but it is better to consider this tendency to variation as part of its specific character, than to indicate the varieties as essentially and permanently distinct. It might be worth while, however, to examine the *eyes* in living specimens, as any marked dissimilarity in the colour and markings of these organs would afford more distinctive and satisfactory characters than any hitherto detected.

(*To be continued.*)

IX.—*Contributions to the Natural History of Ireland.* By William Thompson, Esq. Vice-President of the Natural History Society of Belfast.

No. I. *Sterna stolida.—Larus Sabinii.—Cygnus Bewickii.* *

Sterna stolida, *Linn.*

In March 1833, when looking over the collection of Irish birds belonging to Thomas W. Warren, Esq. of Dublin, I perceived, to my great surprise, amongst them (though passing merely under the name of Black Tern, on account of the dark hue of its plumage,) a specimen of the *Sterna stolida*. On being informed that this bird had been received as Irish from William Massey, Esq. of the Pigeon-House, and that his collection contained a second specimen, I waited on this gentleman to make inquiry respecting them. In May 1834 he informed me, that in the summer about four years since, he was favoured with the two specimens in question by the captain of a vessel, who stated that they had been shot in his presence a few days before, between the Tusker Light-House, off the coast of Wexford, and Dublin Bay. That only a few days had elapsed since these birds were killed was apparent, not only to Mr Massey himself, (who, from occasionally preserving birds for his

* Part of a paper read before the Linnæan Society of London on April 15 and June 3, 1834.

own collection, is conversant with such subjects,) but to Mr Glennan, the bird preserver, by whom they were set up. Their having been skinned by an unskilful person, who left some of the flesh adhering to the skin without applying any preservative to it, proved their comparatively recent state to more than one sense.

The history of these birds, as just given, was related to me when I first saw them ; but I did not feel myself warranted in thus bringing it forward, without having the direct testimony of Mr Massey. Both specimens are in mature plumage. This is, I believe, the first record of the occurrence of the *S. stolida* in Europe.

Larus Sabinii.

On the present occasion I have not only the high satisfaction of enriching the British Fauna, by adding to it the beautiful *Larus Sabinii,* so lately discovered, but of describing the species in the plumage of the first year, in which attire it has never come under the inspection of the ornithologist. The bird now exhibited was shot in Belfast Bay, on the 18th September 1822, by the late John Montgomery, Esq. of Locust Lodge, who carefully preserved it, under the impression that it was an individual of the closely allied species *Larus minutus,* by which name it was distinguished, when presented in April 1833 to the Natural History Society of Belfast. Mr Montgomery informed me, that from the diminutive size, &c. of this bird when first seen by him, he had no doubt of its rarity. It was so unwary as to alight once or twice within twenty yards of him ; but, to avoid disfiguring it, he fired from so great a distance, that it was only at the third shot eventually obtained. That the species is regardless of the report of a gun, was witnessed by Captain Sabine in its breeding haunts, within the arctic circle, as he states, that " when one bird of a pair was killed, its mate, though frequently fired at, continued on wing close to the spot where it lay."

Although the *Larus Sabinii* closely approximates the *Larus minutus* in general appearance, the plumage of the first year, as well as that of maturity, being very similar in both species, the superior size of the *L. Sabinii,* its tail being forked to the depth of an inch, and the comparatively greater length of its tibia and tarsus, may always (even in a preserved state) afford sufficient specific distinction. In the form of the tail, the *L. Sabinii* approaches the typical species of *Sterna* more nearly than its congener, the *L. minutus.* The latter, however, resembles that genus more in the form of the bill, and in the dimensions of the tarsus and tibia.

In this specimen of the *L. Sabinii,* in the autumnal plumage of the

first year, the forehead, space immediately above the eye, and between it and the bill, (with the exception of the narrow line of greyish-black closely encircling the front and lower part of the eye,) upper part of the throat, and sides of the neck are white; crown, nape, and back of the neck, blackish-grey; back, scapulars, greater and lesser wing-coverts, blackish-grey, tinged with yellowish-brown, the extremity of every feather varying from greyish-white to white, as it approaches the tail; under part of the throat and upper part of the breast, pale ash-colour; lower breast and all the under plumage, white; shafts of the first 6 primaries brownish-black at base, becoming gradually darker towards the extremity, where they are black in the first 3, but in the 4th, 5th, and 6th assimilate in colour to the feather at that part, which is white; the entire of the outer webs of the first 5 black; the inner webs, with a broad edging of white, to within from one to two inches of the end, which part is black in the first 3, but tipped with white in the 4th and 5th; in the 6th the inner web is white, the outer black, excepting for three or four lines from the tip, where it is white, and again, at about an inch from the end, where a white spot of an oval form appears. * Feathers of the tail 12 in number, white, with black tips; in the two shortest the latter colour extends upwards of an inch from the end, in the outer web especially; of the other feathers, the black prevails in a less degree as they increase in length; upper and under tail-coverts white.

Length, (total)	12 inches.	0 lines.
of tail,	4	9
wing from carpus to end of 1st quill,	10	0
bill from forehead to point,	0	10
bill from rictus to point,	1	5
tibia bare of feathers from the tarsal joint for	0	9
tarsus,	1	4
middle toe and nail,	1	1½
outer toe and nail,	1	1
inner toe and nail,	0	9½
hinder toe † and nail,	0	2
Depth of fork of tail,	1	0

In the museum of the Royal Dublin Society, I lately observed,

* This marking of the 6th primary is just the opposite of that observed by Mr Sabine in some mature specimens, in which its prevailing colour was white, "with sometimes a black spot near the end." Dr Richardson has remarked, in the Fauna Bor. Amer., that this primary is subject to variation.

† This is placed so high that the point of the nail does not reach within 1½ lines of the ground.

without having any label attached so it, a second specimen of *Larus Sabinii*. Upon inquiry from Mr Wall, the very obliging curator (who treasured the bird as a rarity, though he had not ascertained its species,) I learned that it had been shot by himself in Dublin Bay, near to Kingstown, a few years before, but he could not recollect at what season. The stage of plumage, however, affords sufficient evidence that it was killed in autumn, being a bird of the first year, and similar in appearance to the specimen in the Belfast Museum.

The occurrence of only two specimens of this Gull within the Eastern Hemisphere, has hitherto been recorded, both of which were obtained by Captain Sabine at Spitzbergen.

Cygnus Bewickii, *Yarr.*

In the winter of 1829–30, a specimen of the *Cygnus Bewickii*, shot, I believe, in Lough Neagh, was brought to Belfast market. It was purchased for the Natural History Society of that town, and set up for their museum, the sternum, trachea, &c. being carefully preserved. In February 1830, a flock containing seven of these swans alighted in a flooded meadow near Belfast, when they were shot at, and two of them so disabled by the one discharge, as to be after some difficulty secured. They were bought by my friend William Sinclaire, Esq.; and on their wounds being found so trivial, as merely to incapacitate them from flight, were placed in his aquatic menagerie, where, in company with many other species of wild fowl, chiefly *Anatidæ*, they have ever since remained. On March 13, 1830, another specimen of *C. Bewickii* appeared in our market, and met with a purchaser in my friend Richard Langtry, Esq., who has it preserved in his collection.

On a comparison of the first mentioned individual, with the description of *Cygnus Bewickii* by Mr Yarrell,* Mr Selby,† and Sir William Jardine,‡ I found the internal structure to agree, but in the external characters, there was one important difference, the number of tail-feathers being 20 instead of 18, as specified by these distinguished ornithologists. The result of this discrepancy induced me in February last to examine Mr Sinclaire's birds, which I did, with the assistance of that gentleman. These individuals differed from the descriptions above referred to in the following

* Linnæan Transactions, Vol. xvi. p. 445. et seq.

† Illustrations of British Ornithology, letter-press to, *pro tempore*, p. 119.

‡ Jardine and Selby's Illustrations of British Ornithology, part 6.

characters:—In the number of tail-feathers, which in both birds amounted to 20;* in the irides, those of both birds being blackish instead of orange-yellow. The feathers on the forehead and region of the eyes were white, though the plumage of these parts was of a rust colour when the birds were captured. The two preserved specimens also have this rust colour about the head, but do not, like the immature birds described by Mr Yarrell, exhibit the least appearance of it on "the under surface of the belly." This part of the plumage being white, hence we may conclude, that the specimens under consideration were older than those so described by that gentleman, and that the head of the *C. Bewickii* retains the reddish plumage for a longer period than the under parts. Mr Yarrell has correctly remarked, that the plumage of the *C. Bewickii* is "ultimately pure white;" but Sir Wm. Jardine and Mr Selby have assumed that the ferruginous markings on the head are permanent, as they are thus described in their specific characters of this swan, "fronte genisque ferrugineo maculatis." In one of the living birds there is not even, up to the present time, the slightest appearance of a tubercle or knob at the base of the upper mandible. This swan seems to be a female; her neck, whether on land or water, is always borne in such a manner as to appear much shorter than that of her companion: the yellow of her bill also is of a pale lemon-colour, whilst that of the other bird is orange: there are also such other differences observable as serve to distinguish the sexes of swans and geese in a living state. In conclusion, I shall only remark, that these swans were similar in length and breadth, each being 3 feet 10 inches from the point of the beak to the extremity of the tail, and 6 feet 4 inches across the wings: that the tubercle on the bill of the assumed male has not during four years increased in size; and that this ridge of the upper mandible in the assumed female is black from base to point, a small patch of pale-yellow, irregular in outline, appearing on the sides only of that mandible, about 3 lines from the base; the yellow colour is indeed differently disposed on the bills of all the four specimens.

Mr Sinclaire informs me, that every spring and autumn since he has had these swans, they have regularly, about the months of March and September, become very restless, and for the period of at least three weeks, have wandered from the enclosure within which they are contented to remain all the rest of the year. In disposi-

* In the Fauna Bor. Amer. part 2, p. 465, a specimen killed at Iglvolik is described as having 18 tail-feathers, and the irides of an orange colour.

tion, they are timid and extremely gentle, and never attempt to molest any of the wild fowl confined in the same pond with them, though all of these are their inferiors in strength and size. Their call, chiefly uttered at the migratory periods, is a low deep-toned whistle, once repeated. On the water, the carriage of the *Cygnus Bewickii* is intermediate in its character between that of the mute swan and common goose; but if these birds exhibit not the grace and majesty of the former on this element, they appear to much more advantage on the land, where, by choice, they spend the greater portion of their time.

The Museum of the Royal Dublin Society contains a specimen of the *Cygnus Bewickii* (though not so labelled) which was shot in November 1830, on the west of Ireland. It exhibits the rust-colour on the head, indicative of immaturity. In the collection of William Massey, Esq. of the Pigeon House, Dublin, I recognized another individual of this species, in the immaculate plumage of maturity. This was, along with a second specimen, killed by Mr Massey, out of a flock of five, in Dublin bay, on the 18th December 1829. The *Cygnus Bewickii* has not before been recorded as occurring in Ireland.

I subjoin the following notes, made subsequent to June 3, 1834, when the last part of this paper was read:

Larus Sabinii.

"A third specimen of this bird occurred last autumn in Ireland. It was shot on or about September 15, 1834, on the shore of Belfast Bay, near Claremont, the residence of Mr Clewlow, in whose possession it now is. It is a young bird of the year, and in plumage similar to the other two individuals of this species, which I had the satisfaction of announcing to the Linnæan Society, last year, as having been obtained in Ireland."* The dimensions of this bird, taken in the same manner, and compared with those of the individual above described, exhibit but one difference at all worthy of notice; its first quill being longer than the second, though the second slightly exceeds the first, in the latter specimen.

Cygnus Bewickii.

June 1834. On a fine sheet of water, in the demesne of the Marquis of Sligo, at Westport, county of Mayo, I observed a swan

* Proceedings of the Zoological Society of London for 1835, p. 83.

of this species, in mature plumage, but could not learn any particulars of its capture. January 5, 1836. William Sinclaire, Esq. informs me, that he heard of two "strings" of wild swans, consisting of twenty-eight birds, having been seen yesterday at the bog-meadows, near Belfast; and that he to-day saw a string of nineteen, flying with extreme slowness, from the direction of Belfast Bay, to the same place: from their call, though somewhat hoarser, being like that of the individuals in Mr Sinclaire's possession; and from their apparent similarity in size, he was fully satisfied that they were the *Cygnus Bewickii.*

Dublin, February 5, 1836. In a letter to me of this date, Robert Ball, Esq. mentions having recently got three specimens of *Cygnus Bewickii;* two of which were shot in the county Fermanagh, and a third he bought in Dublin market; along with the last, there was another exposed for sale, but he could not ascertain where they were killed.

March 17, 1836. I examined a specimen of *Cygnus Bewickii*, which was shot at Lough Beg, adjoining Lough Neagh, on the 12th instant. Its length is 3 feet 9 in.; tail feathers 20; knob in bill very small; feathers on forehead deep rust colour; on sides of head tinged with pale rust-colour at their extremities; tips of feathers on breast and entire under surface of belly of a rust-colour, so extremely pale, as to have the appearance merely of being soiled; bill pale orange on the ridge, as far as nostrils: on the sides, this colour advancing a little farther, thence to tip black. On dissection, it proved a female. Its stomach was filled with minute seeds and gravel. As I have, during the last two months, heard of flocks of wild swans being frequently seen on Lough Neagh, there is little doubt that they have been there since first observed in January, and that they will most probably remain until the period of their vernal migration. The five remaining birds of the flock, out of which Mr Sinclaire's specimens were obtained in 1830, went off in the direction of Lough Neagh, and a similar number, presumed to be the same individuals, were a few days afterwards seen in the flooded meadows, where they had been fired at. This is mentioned, simply to show their continuance in the neighbourhood.

Although the *Cygnus Bewickii* is considered to visit England less commonly than the *Cygnus ferus*, it is certainly of more frequent occurrence than this species in Ireland.

X.—*Description of two new species of Opuntia ; with remarks on the Structure of the Fruit of Rhipsalis.* By Rev. J. S. Henslow, M. A. Professor of Botany in the University of Cambridge.

Sp. 1. *Opuntia Darwinii*,—prostrata, articulis globoso-ovatis, aculearum validioribus elongatis tricuspdiatis, floribus magnis solitariis. Plate XIV. Fig 1.

The terminal articulation (the only one seen) globoso-ovate, with distant areolæ beset with short tomentum, and those towards the anterior extremity with four to six stiff spines of various lengths, of which the stoutest are one and a half inches long, evidently formed out of three combined, and whose points are free, so that the compound spine appears compressed and tricuspidate. They mostly point forward, but some spread in all directions. Flowers solitary, larger than the articulations which they terminate, yellow. Perianth of six whorls, each of five parts, gradually passing from the form of small fleshy bracteal scales to membranous petaloid segments ; spirally arranged at somewhat more than the fifth of a circle asunder, so as to form five distinct secondary spirals, corresponding to as many, formed by the areolæ on the fleshy tube investing and surmounting the ovarium. These areolæ are placed upon slight tubercular elevations, each bearing a small fleshy bracteal scale, in whose axil is a tuft of yellow tomentum, and those on the upper extremity are also furnished with about half a dozen stiff acicular spines. The segments of the perianth pass gradually from the ovate-apiculate bracteal form of those in the outermost whorl to the cuneato-obcordate, and slightly mucronate petaloid form of those in the innermost, (Fig. *b*.)

Stamens numerous, covering the inner paries of the fleshy tube, (Fig. *c*.) Style remarkably stout, cylindrical, with nine thick radiating stigmata, reaching above the fleshy tube, and a little beyond the uppermost stamens. Ovarium, a small cell, the width of the style, surrounded by the very thick fleshy walls of the lower part of tube or floral receptacle. The character of the herbage appears to agree with that of *Cactus moniliformis*, Lin., which De Candolle places in his division Opuntiaceæ of the genus Cereus; and of which division he says, " An genus proprium inter Cereos et Opuntias medium ?" The flowers of our plant, however, are strictly those of an Opuntia. In assigning the character of " tubum suprà ovarium nullum" to Opuntia, De Candolle must consider the whole of the fleshy tubular portion of the receptacle to which the stamens are at-

tached as part of the ovarium, which, inceed, it appears to be, when seen from the outside of the flower, but in a transverse section (Fig. *c.*) is evidently prolonged above it.

I have named this interesting Cactus after my friend C. Darwin, Esq. who has recently returned to England, after a five years absence, on board his H. M. S. Beagle, whilst she was employed in surveying the southernmost parts of South America. The specimen figured was gathered in the month of January, at Port Desire, lat. 47°. S. in Patagonia. He recollects also to have seen the same plant in flower as far south as Port St Julian in lat. 49°. S. It is a small species growing close to the ground on arid gravelly plains, at no great distance from the sea. The flowers had one day arrested his attention by the great irritability which their stamens manifested upon his inserting a piece of straw into the tube, when they immediately collapsed round the pistil, and the segments of the perianth soon after closed also. He had intended to procure fresh specimens on the following day, and returned to the ship with the one now figured, but unfortunately she sailed immediately afterwards, and he was prevented from obtaining any more. The geographical position of this species is beyond the limits hitherto assigned to any of the order, which are not recorded as growing much south of the tropic of Capricorn. The climate is remarkably dry and clear, hot in summer, but with sharp frosts during the winter nights. He found Cacti both abundant and of a large size, a little further to the north at Rio-Negro in latitude 41°. S.

Sp. 2. *Opuntia galapageia.*—articulis compressis (saltem junioribus) obovato-rotundis, aculeis setiformibus, longis, penicillatim dispositis, lanugine suprà ovarium densâ.

Plate XIV. Fig. 2.

I am also indebted to Mr Darwin for this second Cactus, of which he brought home in a dry state the specimens here figured. He found it at the Galapagos islands, where it attains to the form of a tree, averaging from six to ten feet high, and about a foot in diameter, perfectly cylindrical or very slightly tapering. The bark is pale-coloured, and in old trees hangs in a ragged manner upon the trunk, which is covered with very strong sharp spines, five to ten of which are set in each fasciculus, in a radiatory manner. From the summit of the trunk numerous branches spread on all sides, somewhat in the manner represented by Fig. *f.*, taken from a very rude sketch of Mr Darwin's. He states these branches to be composed of compressed, rounded, oval articulations, each of which is about one foot in length, wholly without the true spines found on the trunk; but

with numerous scattered fasciculi of long elastic bristles strongly resembling hogs' bristles.

Flowers solitary small, like those of *O. Hernandezii*, a few together on the edges of the articulations, (Fig. *b*) red, with the lanugo in the areola on the ovarium dense, especially towards the upper parts, and with a dense tuft also surrounding its base. Outermost segments of the perianth somewhat scarious, cuneato-obcordate, with an apex, the innermost membranaceous petaloid obovate, emarginate, with a slight mucro. Stamens very numerous and crowded, covering the whole inner surface of the tube. Style cylindrical, stout, (flexuous?) with eight stigmata, which are thick, erect, and closely appressed.

This species grows in the lower regions of James's Island, one of the Galapagos, where the soil is extremely arid and rocky, and where it is the only plant of sufficient magnitude to afford any shade, the next in size forming nearly leafless bushes. The want of water is very great, and the succulent branches of these trees are eagerly devoured by the large tortoises from which the islands have received their name, by large lizards which also abound, and by various other animals. Mr Darwin considers that they are occasionally furnished with a supply of this food from branches broken off by the wind. He found that lizards four feet in length were easily enticed, whenever he threw them a piece of a branch, and small birds would come within a few feet of him and peck at the one extremity, whilst the lizard was eating at the opposite end.

Another Cactus was observed in these islands with the habit of *Cereus peruvianus*, but which does not attain to more than two or three feet in height. It is the first plant that takes possession of the newly formed beds of lava. Not finding it in flower, Mr Darwin did not preserve a specimen.

Explanation of the Figures.

Fig. I. *(a)* an articulation with a flower; *(b)* a petal; *(c)* a longitudinal section of the flower, shewing the position of the stamens, &c. All of the natural size.

Fig. II. *(a)* part of a large articulation, with a young one attached to it; *(b)* four flowers, one expanded, and three in bud, seated on the edge of an articulation; *(c)* a longitudinal section of a flower bud enlarged; *(d)* a sepal or outer segment of the perianth; *(e)* a petal or inner segment; *(f)* a rough sketch of a tree. All, except *c* and *f*, of the natural size.

On the Structure of the Fruit of Rhipsalis.

The fruit of Rhipsalis has been considered to possess a different structure from that of all other Cacteæ, in having placentæ in the axis of the berry instead of on the paries, and the berry itself has also been considered as probably trilocular, whilst those of all other genera in the order are unilocular. Hence De Candolle has placed it in a separate tribe, his Rhipsalideæ, expressing, however, some doubts about the accuracy of the observations upon which he has founded his arrangement. In his last memoir on the Cacteæ (1834,) he separates *Rhipsalis salicornioides* from the rest, under the generic name of Hariota; and in that species he states that he had ascertained the ovary to be unilocular, and the placentæ parietal. I have lately had an opportunity of examining the fruit of *Rhipsalis cassytha* in all stages of its growth, and can safely assert that both suppositions, of its being trilocular and having central placentæ, have originated in a mistake. When the fruit is ripe, the seeds are nestled in the midst of a very liquid pulp, and are no longer attached to any part; but in earlier stages of its growth, they are found to adhere in double rows upon three placentæ, disposed longitudinally on the paries. At first sight there is a deceptive appearance of three dissepiments, or at least of three inwardly projecting placentæ, to the innermost extremities of which the seeds are attached; but further examination shews this to arise, merely from the close agglomeration of the funicular chords (see Fig. A,) which stretch from the paries towards the axis, and from whose extremities the ovules are suspended in a reversed position. The placentæ themselves scarcely form any projection on the paries, as is very evident in some cases where many of the ovules have become abortive;

A

and, indeed, several are so in all cases, and then appear as small brown spots attached to the paries. It seems to me likely that the watery pulp in which the seeds are nestled in this and other genera of the order is derived from the super-developement of the cellular tissue of the funicular chords. The whole coat of the berry, formed by the union of the calyx tube and pericarp, is very succulent, but the interior pulp is much more so; and this does not appear any way connected with, or to originate from the inner coats of the pericarp, but in the way here suggested. Be this as it may, it is sufficiently evident that the ovary and fruit of Rhipsalis are strictly unilocular with parietal placentæ, as in all other Cacteæ, and, consequently, it is necessary that the tribe Rhipsalideæ should be suppressed.

REVIEWS AND CRITICAL ANALYSIS.

Histoire Naturelle des Iles Canaries.—Par MM. P. Barker-Webb et Sabin Berthelot. 4to. avec Atlas in Fol. Livs. i. vii. Paris, 1836.

The Canary Isles are so frequently the first extra-European land which is visited by a traveller, either in the pursuit of commerce, or to explore the riches of nature, that we do not wonder at the delight and enthusiasm with which naturalists have landed on their shores, and enjoyed the few days which the farther progress of the voyage would allow them to devote to their examination. To such feelings we are indebted for the glowing description which M. Humboldt has given us of his six days residence there, on his way to the sterner, and more stupendous scenery of the Andes; and to such more lately, the rapture of D'Orbigny, while traversing their ravines before proceeding to the same regions. These islands have also been a favourite theatre for the experiments of many men well versed in the physical sciences, or attached to the history of the laws affecting the geographical distribution of plants. Their geography and history have received able contributions from Fuillée, George Glass, Bory de Saint Vincent, Cordier, and others; while the short visit of Humboldt, and the residences of Broussonet and Von Buche, produced a mass of information of the utmost importance, both to the above-mentioned branches and to their natural history. But the works of all these able men are scattered, and seem to have been severally conducted with no view to any general plan. The authors of the work whose title we have just quoted, on the other hand, possessed of all the knowledge which the researches of their predecessors could give, have undertaken a series of observations, which time has enabled them to complete, and of which the commencement is given in the livraisons now before us.

M. Berthelot arrived in Teneriffe towards the end of 1829, and, during a residence of ten years, explored the riches of the island, while at the same time he endeavoured to perfect the management of an acclı-

matory garden, which he had been requested by the Marquis Villa Nueva del Prado to superintend. This important object was frustrated by an ill-natured jealousy and the spirit of party, which, though it rendered his attempts for that purpose unavailable, permitted him more leisure, which was profitably employed in researches through the island. In 1828 he was joined by Mr Webb, and the two following years were spent in exploring Teneriffe, and the adjacent Canaries.

The plan of Webb and Berthelot's, "*Histoire Naturelle des Isles Canaries,*" is as follows :—The work will form three quarto volumes, with figures on a similar scale, accompanied by a folio atlas, containing from twenty-five to thirty plates, and the whole number of plates engraved or lithographed will be about 300. The first volume (to be sold separately,) will contain a kind of historical miscellany,—the History of the Conquest of the Canaries, Statistical tables, &c. The second volume will comprehend the Geography, Geology, and Zoology ; while in the third will be given the general Flora of the Canaries, their botanical geography and phytography. Fifty livraisons will complete the work, and two numbers are published monthly.

It is with the zoology and botany that we feel most interested. The first we cannot now enter on, no part of the letter-press having yet appeared, and only one plate of the illustrations being published, a figure of *Fringilla Teydea*, w. and B. male and female; a lovely finch, and so far as we can judge from the well-executed figures, joining the finches to the Tanagers by means of the birds allied to *Tanagra episcopus*.

In the botanical portion we shall first speak of the plates of the phytographic department, or the figures of the species which have been thought worthy of illustration. (None of the descriptive letter-press has yet appeared.) These are engraved upon stone by M. Vielle of Paris, in a style of sharp boldness which could not be improved by the graver, while the details and characters are executed with decision and botanical accuracy. The colouring is slight, but sufficient and clean, and as figures they will rank with the performances of masters of the science and the art. The *Cistineæ, Cruciferæ, Frankeniaceæ, Resedaceæ, Hypericineæ, Malvaceæ*, and *Zygophylleæ*, have been already partly illustrated.

The phytostatic branch of the work, to us the most interesting as perhaps comparatively the most novel, is much more difficult, and requires a union of talent for its execution, which is not always to be found combined. We are happy, however, to think that some

travellers are following the hints which were given by Martius in his "Palms," and in his interesting plate of the "interior of a Brazilian forest." D'Orbigny has commenced this plan in his great work though only one plate has yet been given; and in the publication before us we have already six views of some of the most prominent regional vegetations. There is something peculiar in the vegetation of every clime and country which stamps the landscape for its own, The deep and sombre gloom of the European pine forests, or the grander character of those of the new world. The "gray old trunks that high in heaven mingle their mossy boughs," the peculiarity of the carpet underneath, "Beauty such as blooms not in the glare of the broad sun," would form pictures strong in contrast with the rich and broad foliage of the tropics, their profuse blossoms and their gorgeous hues; and which would show even a wider change if compared with the low vegetation of the far north; clothing a view often boundless in extent with a uniformity of colouring, dark green and gloomy, or brown and sombre, and interrupted only by some pinnacle of cold grey rock, or the icy glance of some distant water. In these landscapes, however, the general characters would be at once felt and caught, and the distinction could not fail to be marked; but when the zonal plants of an island have to be characterized, the short and peculiar growth of the coast contrasted with those of higher regions, we find the artist at a loss and hampered, and the aid of the botanist required. Hence it is, that such views as we have now before us, are of most difficult execution, for while the vegetation must be the prominent feature in the landscape, it should not be such as to affect the harmony of the whole. This it never does in nature, and it is only when transferred to the canvass that the inferiority is perceived, and the difficulty of its execution ascertained.

In the phytostatic views already published, though a great deal is sacrificed, and properly so, to the botanist, there is in some of them considerable merit as pictures, and no over obtrusion of the vegetation. We like No. 1 and 3 best. The first is a view of a mountainous coast, the rocks tufted with *Euphorbia Canariensis* and *piscatoria*, *Kleinia neriifolia*, whose rather stiff appearance is relieved by the *Plocama pendula*. No. 2, Vue d'un Baranca, something in the same style of mountain and precipice, is curious, but not so much to our taste. It is a stiff landscape. But No. 3, "Vue de grand ravin du Badajos," with a little more force, would make a grand picture, while the introduction of some wild animals, or the soaring of an accipitrine bird, (if such in reality abide there,) would give ex-

pression to the solitariness. The other three are interesting, but want force as landscapes ; and in No. 4, the interior of a forest, there is a want of richness as well as force, which we are certain the original would admit of ; the great mass of vegetation in the centre is quite undefined. But we have another series of plates belonging to this part, and which are useful ; they are termed "*Facies*," and represent small groups of plants on a considerable scale, illustrating their natural characters when growing together. These two series of views in combination give all that is desired, and we would only recommend to the artist to use a little more decision.

Of the letter-press belonging to the botanical portion of this work, two chapters have been published, of which the first, devoted to the general vegetation of the Canary isles, "*Aspect général de la vegetation dans les Iles Canaries*," has been already well translated in Dr Hooker's Botanical Miscellany, and will be found worthy of perusal where the original cannot be procured. We transcribe the opening paragraph, which will both exhibit a specimen of the style of the authors and explain some of the views which are entertained of the botany of the group.

" Les Iles Canaries, par leur proximité des tropiques, se tiennent situées sous une des latitudes les plus favorable à la végétation ; leur climat se ressent à la fois de l'énergie de la zone torride, et de la fraicheur de la zone tempérée. La chaleur du soleil s'est combinée avec le principes le plus actifs pour féconder cette terre que les volcans semblaient avoir frappée de sterilité placées dans d'autres conditions d'existence, de nouveaux germes se sont développés ; se sol vierge s'est couvert des produits d'une flore spéciale, et plus tard les influences climatériques sont renues se prêter à la naturalisation des planies des deux hemisphères. Les espéces aborigénes qui apparerent spontanément dans ces îles Atlantiques, appartiennent la plupart à des genres d'Europe, mais elles sont plus vivaces, plus ligneuses, et souvent arborescentes. Il en est aussi d'autres qui ont d'autres formes et un autre aspect ; plusieurs sont des monotypes de genres qui n'ont pas encore d'analogues, tandis que d'autres constituent des groupes d'espèces endémiques d'un *facies* remarquable. Parmi ces végétaux divers, ceux-ci sont empreints d'un caractère, Africain, et ceux là, quoique'n plus petit nombre, laissent déjà enturois quelques traits de la végétation d'Amerique. Ainsi la flore Canarienne parait établir le passage des plantes des nos pays tempérés ă celles des contrées intertropicales. Si l'on a égard à la quantité des espèces locales, à la nouveauté de leurs formes à l'etrangeté de leur port, caractères d'autant plus frappans qu'ils appartien-

nent à la masse des plantes dominantes, l'archipel des Canaries mérite bien le titre de *Région botanique.*"

In very many instances do these islands present most interesting subjects for the researches of the botanist and vegetable physiologist. The mixture of species from a temperate clime with those of the tropics, as mentioned in our quotation, is important, but every island in the group presents something curious in the general aspect of its vegetation; each may be said to possess a miniature Flora of its own; and there are in all, species, which are either peculiar, or are remarkable for their abundance in only one or two stations; while the more that an advance is made towards the centre of the Archipelago, the richer does the Flora become in Canarian species.

The western group of these islands differs very markedly from the eastern, and possesses some species quite exclusively. A new species of a Cape genus, *Manulea Canariensis*, W. and B., is established in the ancient crater of Bandama, and *Commelina Canariensis* is only found on the banks of the rivulets around Cuidad and Terror. At Palma, the *Umbilicus Heylandii*, W. and B., is found only in the pine woods of Barlavento. The *Sempervivum Goochiæ*, W. and B., grows only in the ravines of the eastern coast, while the *Bethencourtia Palmencis* is almost concealed in the immense depths of the Caldera. The existence of these plants, and of many others in solitary stations, seems quite inexplicable, and appears to be much influenced by local circumstances of soil and atmosphere. "Les lois de la repartition des germes sur la surface du globe, peuvent seul donner l'explication de ces bizarres anomalies: Mais ces lois se lient, aux causes premieres par lesquelles la nature agit secretement; ce sont de principes qu'elle ne nous a pas révéles, et de long-temps, peut-etre, nous ne pourrons pas plus pénétrer le mystere de ces creations spontanées que celui de leur stabilite ou de leur migration."

The littoral aspect of Teneriffe, as well as that of Canaria, Palma, Gomera, and the "isle de Fer," present as it were a bulwark of cliffs. The plants in these districts take root in the chinks, clothing the slopes and flats that surmount them. They are for the most part species with fleshy leaves, which imbibe the vapours of the atmosphere, or the exhalations from the sea-breeze. They belong to the *Ficoideæ, Chenopodeæ, Euphorbiæ, Crassulaceæ,* &c., and though these sometimes overrun the slopes of the valleys, and the sides of the ravines, they cannot exist far from the influence of the sea. On a little higher range we have another tribe of succulent plants, *Sempervivæ,* but which are not so dependent on the same circumstances of exposure. They are a numerous class, and grow on old walls or mural precipices, where the moisture, though abundant, does not lodge or remain long at a time. Rising above these cliffs the

country stretches into plains, which again rise towards the centre of the island, and are rent into valleys and ravines. Here the vegetation is characterized by naked trunks, and pale glaucous foliage, and assumes an African character; *Euphorbia Canariensis* prevails, mixed with *Kleiniæ* and *Plocamæ*. But in the valleys intersecting this maritime expanse, a much more anomalous mixture is presented, for the introduced species, the date, papaw trees, orange, peach, and banana, mingle with the *Dracœna, Bosea,* and *Ardisia.* The ravines in these islands also affect a peculiar character; they are commonly like large fissures radiating from the centre, with precipitous basaltic walls on each side, often 800 feet in height, and sometimes so near and narrow, that the plants on either side weave a canopy above. At their entrance, the vegetation of the coast is prevalent, but it changes with rich luxuriance, and ultimately assimilates with the character of the woods, and exhibits scenes of grand and picturesque beauty. Thus they lead to the region of the forest, where the laurels prevail over all the other woody plants, and where the four Canarian species, *L. Canariensis, Indica, barbusana* and *Persea fœtens,* mingle with the heaths, *Visneæ, Ilex,* and *Arbutus.* Next rise the wasted plains where vegetation, at first luxuriant, becomes gradually more thin and scattered, and at last is restricted to bushes of *Cytisus* and *Pteris,* which spread in masses to the boundaries of the pine woods. The Canary pine, in general form and appearance, resembles the species of Europe, and this region calls to mind the appearance of our alpine forests. It grows on the steep slopes, and more elevated descents of the mountains, but seldom surmounts the crests of the ridges. Underneath these gigantic trees, the soil is dry and light, and the number of nemoral plants is comparatively limited. Ascending still higher, the pinnacles which surround the peak, when seen at a distance, appear bleak and barren, but even here there are several plants which cannot be elsewhere gathered, such as *Carlina xeranthemoides, Cheiranthus scoparius,* or the *Plantago Teydea*; a single shrub *Rhamnus coriaceus* grows only on the summit of Guaxana; the *Juniperus cedrus* crowns the cone of Cedro, while the Rose of Armida, and a variety of *Pyrus aria* inhabit exclusively two spots considerably apart from each other, the mountain of Rosal, and the Tiro del Guanche of the Cānadas,—and above this elevation, when the traveller reaches the peak itself, the 'Teyda," the vegetation of these wild regions is found to be altogether original. *Cytisus proliferus* is the first shrub which is seen on entering the gorge of the Cānadas, then *Adenocarpus frankenioides* and *Cytisus nubigenus;* lastly, *Silene nocteolens,* and *Viola cheiranthifolia,* appear on the peak itself, among masses of pumice, the last of

the flowering plants. Lichens and a few minute mosses mark a farther but now nearly exhausted state of vegetation; and at 11,424 feet *Weissia verticillata* springs in the crevices, heated by the constantly exhaling vapours. Such is a very rapid sketch of the manner in which the plants rise from the coast to the nearly barren summits.

In the second chapter, the "Distribution Phytostatique," the distribution of the plants, taken according to the mass of species which prevail in certain ranges, from the shore to the summits of the peaks, with the relation between the vegetation and the climates, have served MM. Webb and Berthelot for the basis of their tables. These differ considerably from those of their predecessors in research: Humboldt selecting Teneriffe as possessing the greatest range of elevation, and placing a height of 10,500 feet as the limit of vegetation, divided their altitude into five zones, viz. the zone of *Vines;* of *Laurels;* of *Pines;* of the *Retamas;* and of the *Gramineæ*. Our authors, in dissenting from this division, observe, that the first zone is inaccurately defined, for the vineyards occupy but a small space in the whole, and do not reach to the sea, while they cease before attaining the elevation marked for the commencement of the second region. The *Quercus Canariensis*, (*Brouss.*) which is noted as indicating the zone of Laurels, is thought to be only the *Q. pubescens*, introduced by the first settlers after the conquest of Teneriffe, and now in a state modified by climate. The *Juniperus cedro*, (*Brouss.*) which is placed in the third zone among the pines, according to the researches of our authors, ought to occupy a much higher station. The zones of the *Retamas* and *Gramineæ*, placed at an elevation analogous to the highest ridges of the Pyrenees, should only include the last; two species of grasses only presenting themselves on the highest range; but our naturalists, at the same time, are unwilling to admit any zone of grasses at all, considering that M. Humboldt must have been deceived by false accounts, and stating, that none of the Cerealia are now cultivated beyond a height of 4,800.

The distribution of Von Buch is also differed from; here the same island is divided into five zones, characterized by elevation and temperature.

I. La region subtropicale ou des formes Africains,	1.200.	cl. Egypt and Barbary.
2. La region Mediterranienne, ou des cultures Europeans,	2.580.	cl. France and Cent. Italy.
3. La region tonjours verte, ou celle des forets,	4.100.	cl. Lyons and Lombardy.
4. La region du pinar, ou des pins des Canaries,	5.900.	cl. France, Scotland, N. of Germany.

5. La region des cumbre, ou celle
des Retamas blancas, . 10.380. cl. N. Scotland, Drontheim.

The first zone is considered to be too restricted, and that it should have extended at least 400 feet higher. The second is not sufficiently defined, from the variable circumstances which influence the distribution of the Cerealia and cultivated plants. The third zone, or that of the forests, is liable to the same objection, a want of sufficient definition ; while the indications of the temperature, and the comparison of it with the climates of Europe, do not give an exact idea of the state of the atmosphere in each region, because there is no proportion of time between the seasons of heat and those of cold. The olive, indigenous to the Canaries, and growing at an elevation of 2,109 feet, has never been naturalized in the basin of the Po, a fact at variance with the stated resemblance of this zone to the climate of Lyons and Lombardy. Neither can the clime of the fourth region be compared with that of Germany or Scotland. In those countries *Pinus Canariensis* can never be kept alive out of the greenhouse.

In fixing their own divisions of the vegetation of Teneriffe, MM. Webb and Berthelot have taken almost every local circumstance into consideration. From numerous observations on the temperature, made at different heights, and kept simultaneously in various stations, the following results have appeared. To the height of 1,500 the temperature continues very equal, varying only from one to two degrees, according to the direction of the openings of the valleys, or as it may be influenced by the exposure, nature of the soil, or proximity to wooded hills. According to the same local circumstances, its variation above a height of 1,500 to about 4,000 is from two to eight degrees ; but in this region clouds and vapours almost constantly rest on the hills and slopes, and afford a supply of moisture most favourable for vegetation, and the plants are thus found here, growing luxuriantly, and distributed in large masses. From 4,000 to the summit of the peak there is not the same moisture furnished by vapour, while the temperature diminishes proportionally to the ascent, and taking a line along the slope of 8,000, a difference is perceived of from nine to seventeen or eighteen degrees below the temperature of the coast. Upon these deductions, and allowing for variation from locality and the state of the atmosphere, our authors have divided Teneriffe into three great climates, and have given three tables, which, while they completely explain their views, are otherwise so extremely interesting, that we are induced to copy them.

PREMIER CLIMAT.

(INFERIEUR.)

EXPOSITION DU NORD.

Limites. Depuis le niveau de la mer jusqu'à 1,500 pieds au-dessus.

TEMPERATURE CHAUDE,

Maximum de la chaleur sur la côte, au niveau de la mer. . . . 30°.
Minimum. . Id. . Id. 16,1
Différence de température avec celle du niveau de la mer, suivant l'altitude des stations de . . . . 1 à 2°
Etat de l'atmosphère. Brises régulières variant du N.-N.-O. à l'E-N.-E.
Ciel presque toujours sans nuages.
Quelques averses de novembre en janvier.
Terrains. Tufs volcaniques, basaltes, scories et nappes de lave en décomposition.
1re *classe.* Grèves bordées de falaises ; coteaux maritimes coupés par des ravins.
2me *classe.* Ravins profonds souvent parcourus par des torrens ; berges escarpées.

VEGETATION.

REGION DES EUPHORBES DANS LES TERRAINS DE LA PREMIERE CLASSE.

PLANTES DOMINANTES : *Euphorbia Canariensis, E. piscatoria, Kleinia neriifolia, Plocama pendula.*

ESPECES EPARSES qui appartiennent aux genres *Conyza, Aizoon, Statice, Artemisia, Prenanthes; Achyranthes, Chrysanthemum, Astydamia, Kochia, Periploca, Frankenia, Crithmum, Forskalea,* etc.

VEGETAUX NATURALISES. Palmiers, Nopals, Figuiers, Agaves, Bananiers, Mariers, Orangers, etc.

REGION DES PLANTES RUPESTRES DANS LES TERRAINS DE LA DEUXIEME CLASSE.

ESPECES EPARSES appartenant aux genres *Hypericum, Bystropogon, Echium, Lavandula, Digitalis, Sonchus, Messerschmidia, Thymus, Tanacetum, Teucrium, Sempervivum, Stachys, Salix, Sisymbrium, Solanum, Pyrethrum, Datura, Cineraria, Anthemis, Asparagus, Athamantha, Canarina, Globularia, Rumex, Bosea, Peucedanum, Phyllis Crambe, Camyglanthus, Carlowizia, Bryonia, Cyperus, Dactylis, Drusa, Lavatera, Adianthum,* etc.

EXPOSITION DU SUD-EST. ET DU SUD-OUEST.

Limites. Depuis le niveau de la mer jusqu'à 2,500 pieds au-dessus, et même plus plus haut dans certaines localités. (Exemp. vallée de San-Jago.)

TEMPERATURE TRES CHAUDE.

Maximum de la chaleur sur la côte, au niveau de la mer. . . 33°,3
Minimum. . Id. . Id. 18,8
Différence de température avec celle du niveau de la mer, suivant l'altitude des stations de. . . . 1 à 2°,5
Etat de l'atmosphère. Calme, parfois interrompu par des vents d'Ouest ou de Sud-Est.
Ciel presque toujours sans nuage.
Pluies fort rares, même en hiver.
Terrains. Nappes de lave, tufs volcaniques, basaltes, scories et ponces en décomposition.
1re *classe.* Grèves, plages sablonneuses, falaises et coteaux maritimes coupés par des ravins.
2me *classe.* Ravins nombreux et très-profonds, rarement parcourus par les torrens, berges escarpées.

VEGETATION.

REGION DES EUPHORBES DANS LES TERRAINS DE LA PREMIERE CLASSE.

PLANTES DOMINANTES. *Euphorbia balsamifera, E. Canariensis, E. aphylla, Cneorum pulverulentum, Zygophyllum Fontanesii, Prenanthes spinosa.*

ESPECES EPARSES appartenant aux genres *Ceropegia, Gnaphalium, Heliotropium, Salvia, Linaria, Lotus, Lycium, Mesembryanthemum, Reseda, Aloe, Artemisia, Notoceras, Paronychia, Physalis, Jasminum, Saccharum, Sempervivum, Sida, Gymnocarpus,* etc.

VEGETAUX NATURALISES. Nopals, Agave, Figuiers, Amandiers, etc.

REGION DES PLANTES RUPESTRES DANS LES TERRAINS DE LA DEUXIEME CLASSE.

ESPECES EPARSES appartenant aux genres *Cheiranthus, Euphorbia, Salvia, Lotus, Dracœna, Helianthemum, Hypericum, Bystropogon, Echium, Juniperus, Lavatera, Lavandula, Convolvulus, Asparagus, Pyrethrum, Rhamnus, Rubia, Sideritis, Sonchus, Cineraria, Conyza, Salix, Bosea, Forskalea, Justicia. Bupleurum, Cyathea, Roccella.*

SECOND CLIMAT.

(INTERMEDIAIRE.)

EXPOSITION DU NORD.

Limites. Depuis 1,500 pieds d'altitude jusqu'à plus de 5,000 pieds.

Température humide.

Différence de la température avec celle de la côte, suivant l'altitude des stations, de 2 à 8°.

Etat de l'atmosphère. Brises fraîches variant du N.-N.-O. à l'E.N.E. Ciel presque toujours couvert de nuages, surtout pendant le jour. Brumes et bruines fréquentes en été. Orages et fortes pluies en hiver.

Observation. La neige, qui, dans la saison hivernale arrive parfois jusqu'à la limite supérieure de ce climat, s'y fond presque aussitôt.

Terrains. Vallées et montagnes ; sol argilo-volcanique chargé d'humus. Laves décomposées.

VEGETATION.

REGION DES LAURIERS ET DES PLANTES NEMORALES.

ESPECES DOMINANTES. *Laurus Canariensis, L. Indica, L. Barbusano, Persea fœtens, Myrica Faya,* et autres espèces éparses appartenant aux genres *Arbutus, Ardisia, Bœhmeria, Cerasus, Celastrus, Erica, Ilex, Myrsine, Olea, Pittosporum, Rhamnus, Viburnum, Visnea.*

ARBRES NATURALISES. *Castanea vesca, Quercus pubescens.*

PLANTES NEMORALES des genres *Adenocarpus, Cineraria, Convolvulus, Dracocephalum, Exacum, Fragaria, Genista, Festuca, Geranium, Hedera, Luzula, Myosotis, Origanum, Ranunculus, Rubus, Ruscus, Scrophularia, Sempervivum, Smilax, Solanum, Viola,* etc.

FOUGERES. Diverses espèces des genres *Adiantum, Asplenium, Blechnum, Cyathœa, Davallia, Gymnogramme, Trichomanes, Woodwardia,* etc.

MOUSSES et LICHENS.

REGION DES BRUYERES ET DES CISTES.

Erica arborea, E. scoparia, Cistus vaginatus, C. candidissimus, C. Monspeliensis, Helianthemum guttatum.

FOUGERES. *Pteris Aquilina, Nothochlæna Marantæ* et N. *vellea.*

EXPOSITION DU SUD-EST ET DU SUD-OUEST.

Limites. Depuis 2,500 pieds jusqu'à environ 4,000 et quelquefois moins, suivant les localités.

Température. Chaude et sèche.

Différence de température avec celle de la côte, suivant l'altitude des stations de 3 à 6°.

Etat de l'atmosphère. Calme, parfois interrompu par des vents de S.-E. très-chauds. Ciel presque toujours sans nuage ; seulement quelques brouillards dans les vallées boisées.

Pluies rares, orages instantanés en hiver.

Observation. La neige descend rarement jusqu'à la limite supérieure de ce climat et s'y fond assuitôt.

Terrains. Vallées et montagnes presque généralement dépourvues de forêts lauriferes, sol la moins substantiel, pentes plus rapides.

VEGETATION.

Seulement quelques petits groupes de Lauriers, d'Arbousiers et de Bruyères dans les gorges les plus anfractueuses du Sud-Est et du Sud Ouest.

Les Cistes en plus grande masse.

Observation. De ce côté les Cistes sont rarement accompagnés par les bruyères ; ils occupent, le long de la bande méridionale de l'île, un espace beaucoup plus large que sur l'autre versant et s'étendent depuis l'altitude de 1,800 pieds jusque sur la lisière des bois de Pins (4,000 pieds). Les principales espèces de la région des Cistes sont le *C. vagi. natus,* le *C. Candidissimus,* le *C. Monspeliensis* et l'*Helianthemum guttatum.* Le *Cistus vaginatus* est toujours l'espèce dominante, le *C. candidissimus* est fort rare ; on rencontre ordinairement le *C. Monspeliensis* dans les stations plus rapprochées de la côte. Quant à l' *Helianthemum guttatum,* il croit un peu partout, même dans la région des Pins.

TROISIEME CLIMAT.

(SUPERIEUR.)

Observation préalable. La distribution phytostatique n'est plus modifiée ici par l'exposition ; les nuages restent ordinairement stationnaires au-dessous de la zone dans laquelle le troisième climat se trouve compris, et les brises de mer exercent peu d'influence à cette hauteur.

Limites. Depuis { 4,000 pieds du coté du Sud / 5,000 pieds du coté du Nord } jusqu'à la cime du Pic (11,424 pieds.)

Température. Assez chaude et sèche pendant le jour, froide et parfois humide pendant la nuit. Différence de température avec celle de la côte, suivant l'altitude des stations, de 9 à 18°.

Etat de l'atmosphère. Vent faible et chaud pendant le jour sur tous les plateaux supérieurs et les crêtes des montagnes ; calme pendant la nuit, mais cet état de quiétude est souvent troublé, au moment du lever du soleil, par les bourrasques subites et passagères qui se manifestent au sommet du Pic (1.)
Ciel sans nuage, air très-raréfié, soleil brûlant, nuits froides, pluies très-rares en été, orages instantanés en hiver.

Observations. La neige s'amoncelle sur les hautes cimes de l'île de Palma, dans le cirque des canadas, à Ténériffe, et sur les crêtes des alentours ; mais le plus souvent elle s'y fond de suite ou disparaît balayée par les vents. Elle n'est permanente que sur le pic de Teyde pendant deux mois environ ; plusieurs hivers se passent même sans qu'elle y reste plus de deux ou trois semaines. La glace ce maintient tout l'année dans la grotte de la *Nieve* à 9.312 pieds d'élévation au-dessus du nivea de la mer. Il gèle quelquefois dans la nuit vers la fin de décembre et dans le mois de janvier, sur les rochers isolés et à l'ombre mais ces sortes de cas sont rares et ne se manifestent presque jamais au-dessous de 7,000 pieds.

Terrains. Talus très-rapides, plateaux et sommets culminans, mornes escarpés et pics volcaniques. Sol presque entièrement envahi par les éruptions, roches trachytiques par grandes masses, tuffs, scories et torrens de lave de différente nature.

VEGETATION.

REGION DES PINS.

ESPECE UNIQUE. *Pinus Canariensis.*

PLANTES NEMORALES. *Helianthemum guttatum, Lotus angustissimus, Festuca Myurus, Erigeron viscosum, Thymus Calamintha, Asphodelus ramosus, Pteris Aquilina,* etc. (A Palma, *Umbilicus Heylandii* N.).

REGION DES LEGUMINEUSES FRUTESCENTES ET DES PLANTES ALPINES.

ESPECES DOMINANTES. *Cytisus nubigenus, Adenocarpus frankenioïdes* (et *Cytisus proliferus* dans des stations inférieures).

PLANTES ALPINES. Eparses à Ténériffe parmi les légumineuses du grand plateau ou cirque des Canadas. *Centaurea aynaroïdes, Chrysanthemum Broussonetii, Echium Auberianum,* N., *Nepeta Teydea,* N., *Polycarpæ aristata, Scrophularia glabrata, Pteris Aquilina,* etc.

ID. sur la crête des montagnes centrales à Ténériffe. *Arabis albida, Carlina xeranthemoïdes, Cheiranthus scoparius, Juniperus Cedrus, Ephedra monostachya, Festuca laxa, Pimpinella Cumbræ, P. Dendroselinum,* N., *Pyrus Aria, var, Rhamnus coriaceus, Rosa Armidæ,* N., *Satureja tenuis, Bethencourtia Palmensis, Tolpis lagopoda, Thymus Benthami,* N., etc.

ID. à Canaria, *Satureja lanata, S. tenuis, Genista microphylla,* etc.

ID. à Palma. *Juniperus Cedrus, Arabis albida, Cerastium strictum, var, Viola Palmensis,* etc.

Sur les pentes du Pic de Ténériffe. *Silene nocteolens,* N. et *Viola cheiranthifolia,* depuis l'altitude de 7,500 pieds jusqu'à 9,850.

A la cime du Pic, sur les bords du cratère (11,424 pieds). *Weissia verticillata, var,* et *Scytonema myocrhus.*

* Ce vent, qui oblige souvent les voyageurs d'abandonner cette station, souffle presque toujours dans une direction contraire au vent de mer.

In these "climates" our learned authors remark, "Nous n'avons valu présenter que la repartition des plantes sous le rapport des espèces qu'on rencontre par grandes masses en suivant une même ligne de pente; le régions que nous indiquons ne sont point des zones de végétaux toujours régulièrement superposées les unes aux autres, mais seulement de groupes partiels et isoles."

And those tables of the geographical distribution of plants, dividing them into defined limits, are considered as much too restricted, and so lose their greatest value, unless the effects of local circumstances, exposure, &c. come to be taken into the account. In fact, that altitude and temperature are not the only circumstances which have to be considered, or that the sort of established rule, "that every 100 feet of height would lower the temperature 1° Reaum., and was equal to 1° of distance from the pole," would depend in many, if not in most instances, upon modifications entirely local. In illustration of this, we may quote a paragraph which soon follows the remarks on zonal vegetation. "Lorsqu' apres avoir parcouru les vertes forets qui couvre une partie des versons du nord de Teneriffe, on tourne l'isle par la pointe la plus occidentale, les bois des lauriers ne se retrouvent plus que dans le fond des etroites vallées comprises entre le Cap de Zeno et le port de San-Jago. Quelque groupes d'arbres forestiers garnissent encore, de ce côté, les anfractuosités les plus humides; tandis que partout ailleurs ce ne sont que pentes arides et nues. A mesure qu'on s'avouer sur le revers meridional, le pays est encore plus dévasté: la, plus de brises rafraichissantes, plus de nuages; mais le climat de la Mauritanie meridionale avec la secheresse desesperante et son atmosphere de feu."

But amidst the varied vegetation of these islands, there are some plants which defy a rule of confined distribution, "plantes vagabondes," as they are graphically termed, which seem to delight in no peculiar zone, and to belong to every climate. Among these stragglers in Teneriffe, *Pteris aquilina, Hypericum grandiflorum,* and *Erigeron viscosum,* are widely scattered; the two first appear at from 1000 to 1500 feet of elevation, and are met with as high as 7000 feet. Some plants which grow at a low elevation, are not found for a long space, but appear again suddenly at some height, thus *Pancratium Canariense,* growing on the shore of the Val-de Guerra, appears again on the plateau of Trebejo, after an interval of 3800 feet.

Among the plants introduced to the Canaries, our authors are unwilling to include the *Dracœna draco.* This plant, supposed to be

a native originally of the East Indies, is found in the Archipelago of the Canaries, as well as at Madeira and Porto Santo. It abounds on the volcanic slopes of the Brēna, in the island of Palma; at Teneriffe, some aged specimens are found in the valley of Oratava, and in the Ravin de l'Enfer; adorning the basaltic pinnacles of the eastern slopes.

Pistachus lentiscus, and *Olea Europea* are profusely distributed over the great Canary, but in Teneriffe and Palma, they have given way to the culture of the vine, though the names, still existing in the hills and valleys, shew that they were once abundant.

There are many other remarks and observations which might be taken from this department, but in noticing them all, we should have in reality to transcribe the chapter. We unhesitatingly recommend the work for perusal to botanists; they will find much information and much useful criticism upon the histories of Humboldt and Von Buch, &c., which have the additional merit of being candidly and modestly expressed, do full justice to the labours of these distinguished individuals, and we feel convinced will be read by them with pleasure, and without any of that feeling of asperity which the remarks of one traveller upon the works of his predecessors so frequently calls forth.

Bibliographical Notices.

Hymenopterorum Ichneumonibus affinium monographiæ, Genera Europæa et Species illustrantes. Scripsit C. G. Nees ab Esenbeck. 2 vols. 8vo.

This work, though one of importance, is known to be merely an extract from a much more voluminous one, still in MS., consisting of ten volumes in quarto. It is preserved in the museum of Bonn, to which the author was formerly attached, prior to his settlement at Breslaw. He had there formed a collection of 25,000 insects, among which are contained all the Hymenoptera described in the work above named. M. Nees d'Esenbeck is a noted botanist, and successfully combines the study of two departments of natural history, the practical pursuit of each of which so well accords with the other. This work may be regarded as a supplement to or rather a completion of M. Gravenhorst's *Ichneumonologia Europæa*, published in three very thick volumes in 1829. These authors worked with a mutual understanding of each others labours, and while the latter undertook and completed the *Ichneumones*, properly so called,

the former, with equal skill and assiduity, has illustrated the *Ichneumones adsciti.*

Forstinseckten, &c. *Forest Insects. The Natural History of Insects which prove injurious to Woods.* By Professor E. A. Rossmæssler. 1 Vol. 8vo. (100 pages) with a lithographic plate. Leipsig, 1834.

This compendious work is one of the few which treats the subject to which it is devoted in a *systematic* manner. It consists of 25 paragraphs, containing observations on the generalities, the classification, the retreats, the nourishment, and the mode of distinguishing insects injurious to trees; likewise descriptions of the species in their different states, and a detailed account of the injuries they occasion. The author confines his remarks to the species which attack forest trees, in strict consistence with the title of his work, although it would have added both to the interest and importance of his labours, had he extended them to the fruit department. He arranges his insect species (only twenty in number) in reference to the trees which they attack:—as follows.

A. Coniferæ.

I. *Pinus abies.*

a. The young plants: Curculio abietis.

b. The old trees: Bostrichus typographicus; Hylesinus piniperda; Bostrichus chalcographus; Rhagium inquisitor (less hurtful than the others); Sirex gigas.

II. *Pinus silvestris.* L.

a. The young plants: Tortrix turiona; Tortrix Buoliana; Curculio abietis.

b. The old trees. Bombyx pini; Bombyx monacha; Geometra piniaria; Noctua piniperda; Tenthredo pini; Bostrichus pinastri.

III. *Pinus picea.* L. Bostrichus abietiperda.

IV. *Pinus larix.* L. Bostrichus laricis.

B. Leafy trees.

Melolontha vulgaris and solstitialis; Bombyx processionea; Bombyx salicis.

Transactions and Periodicals.—*British.*

Transactions of the Zoological Society of London. Vol. ii. Part i. Longman and Co. London. Printed for the Society. 4to. 1836.

With this part a second volume of these beautiful Transactions has been commenced; a publication unrivalled in the masterly execution and accuracy of its illustrations, and doing much honour to the important society by which it is published and patronised.

I. *On the quails and Hemipodii of India.* By Lieut. Col. W. H. Sykes. In the introductory part of the paper, remarks are made on the value of characters, specific and generic, a subject which has long been fruitful, and does now furnish more than the usual material for criticism. We may observe at once, that we dislike *sections* in a genus; if they are very marked, they deserve a more decided separation, if not, they do not require to be sectioned; and it must always be recollected, that if the typical form of a genus is properly selected, in other words, if the genus really deserves that rank, these variations will always mark its correctness, and some species will always be seen with characters called aberrant, uniting them with the genera which stand on either side.

We fully coincide with Colonel Sykes when he says, "I have long thought, and daily experience tends to confirm my opinion, that the researches of present and future naturalists, will deprive discoverers of many of their honours in establishing new species of birds;" at the same time what can they do so long as no authentic system exists.

Colonel Sykes considers that the quails and partridges should be united, that the former are in reality only "dwarf partridges." The characters of *Coturnix* are remodelled, but the structure of the wing is omitted in the generic character, while three sections are formed, two of which depend on "*alis acuminatis*," and "*alis rotundatis*." *Perdix* and *Francolinus* are also considered hardly sufficiently separated, and *H. Ponticerianus* is instanced, but this is just one of the specimens which will stand almost on the confines of either, and will point out their alliance.

Five species of Indian quails are described, three of which are named as new. They are beautifully represented by lithographs from the pencil of Mrs Gould. *C. dactylisonanis*, specimens from India, are considered identical with the bird of Europe, and with those from the Cape, and we agree in the wide distribution given to the species: we know that it stretches nearly over the whole of the old world. *C. textilis* is abundant in Bengal, Madras, and the Dukhun; and it is remarked here, that "so abundant are the different species of quails in the Dukhun, that in April 1829, 517 brace were killed in nine days by four guns." *C. erythrorhyncha*, N. S. met with only in the valley of Karleh in the Ghats, frequenting the same ground with the *Perdix picta*.—*C. argoondah*, rock-quail of the Dukhun, N. S., found in the level country amidst rocks and low bushes, rising in coveys of from ten to twenty or more. There is a bird from the Himalaya closely resembling some of the varieties which Colonel Sykes notices, being without the black markings, and nearly similar in plumage to the female, having the strong bill and slightly graduated quill feathers. The white streak above the eye, however, extends through it to the bill.—*C. pentah*, mountain quail, N. S., met with only on the mountains, seems a very variable species, and specimens from Himalaya, exhibit considerable distinctive marks. We here remark that we dislike the specific names which have been given to the two last, as well as to a *Hemipodius*, (H. Taigoor);

we allow the difficulty of finding appropriate names, but these have nothing to recommend them. Three Hemipodii are noticed, *H. pugnax*, *Dussumerii*, and *H. Taigoor*, N. S., differing from *H. pugnax* in its more slender bill and white chin and throat.——II. *Descriptions of a few invertebrated animals obtained at the Isle of France.* By Robert Templeton, Esq.—Four animals are described, illustrated by a well-finished plate.——III. *On a remarkable species of Pteropine bat.* By E. T. Bennet, Esq.—On several of the bats there seems to be cavities and pouches connected with a glandular apparatus; and in the one now described, there is a patch of long white hairs on each side of the neck, which Mr Bennet suspects is connected with some similar arrangement. This patch is about one inch in diameter; the hairs are longer than those on the rest of the body, and they spring in tufts from a common centre, diverging to either side. In one or two other species, tufts somewhat similar have been observed, but in the present animal the greatest developement of it appears; while in most of them we also have a modification of the form, and a difference in the number of the grinders, which may ultimately be made the basis of characters for a separate genus. This animal has been named *Pteropus Whiteii*, and two plates are devoted to it, one to a figure of the bat itself, another to the appearance of the fur, taken from different parts of the body, greatly magnified.——IV. *Some account of the Crustacea of the Coasts of South America, with descriptions of New Genera and species, founded principally on the Collections obtained by Mr Cuming and Mr Miller.* By Thomas Bell, Esq.—A valuable paper, continued from page 335 of Vol. I. but too long to be slightly noticed here. The first paper was devoted to the illustration of the genus Cancer brought home by the above named collectors, and three new species are figured and described, The present communication is devoted to the *Oxyrhynchi*. They are illustrated by five plates, containing representations of twenty-two species.——V. *Some Observations on the Economy of an Insect destructive to Turnips.* By William Yarrell, Esq.—Observations on the *Athalia centifoliæ*, which has, during the last year, committed so much damage to the turnip crops both in England and Scotland. We regret, however, that the range of this pest has not been more decidedly pointed out. We do not know how far it has extended either to the south or north; and it also appears to have passed, as it were, over some districts, and again appeared. On the Border counties of England and Scotland it was abundant, and committed severe depredations. Figures of the perfect insect, and its different stages, by Mr Westwood, accompany this paper.——VI. *Mémoire sur une Nouvelle espèce de poisson du Genre Histiophore, de la mer Rouge.* Par M. E. Ruppell, M. D. Membre Externe de la Société Zoologique.—The description of *Hist. immaculatus*, Rupp., which that gentleman considers distinct from the three previously known species of the genus. The colours of this fish are of a uniform dull blue above, changing to silvery on the lower parts; the upper fins are blackish blue, the lower greyish and all spotless, with the exception of a dark mark on the pectoral at its lower part. The formula of the fins is—
P. 1 + 19 V. 3 + 0, D. 47 + 0, 0 + 7. A. 10 + 0, 0 + 7. C. 5 + 17 + 5. M. 13. 7.
——VII. *On the genus* Octodon, *and on its relations with* Ctenomys, *Blain. and* Poephagomys, *F. Cuv. including a Description of a New Species of Ctenomys.* By E. T. Bennet, Esq. F. L. S. &c.—An excellent paper, entering in Mr Bennet's *own manner*, into the relations of the genera mentioned above, and illustrated by good figures of *Octodon Cummingii*, and *Ctenomys Magella-*

nicus. One thing we would remark of the very beautiful figures of animals which have from time to time appeared in these Transactions, the effect of the picture is destroyed by the introduction of the skulls and details of anatomy beside the figure; they would be much more efficient for reference, as bold wood-cuts, perhaps, not more expensive. The skull in the plate *of Macropus Parryi* is quite an outrage.

Transactions and Periodicals—*Foreign.*

Annales des Sciences Naturelles. Zoologie, MM. Audouin et Milne-Edwards. *Botanique,* MM. Ad. Brongniart et Guillemin. Crochard and Co. Paris, Mai, Juin, 1836. (Continued from page 413.)

1. *Zoology.*

The few first pages in the Number for May are occupied with the conclusion of Lesson's memoir "*sur les Béroïdes.*"——Ravius *Observations anatomiques sur les Fanons, sur leur mode d'insertion entre aux et avec la membrane palatine.* These observations were made on a specimen of the *Balæna rostrata,* forty-two feet in length and twenty feet in circumference, which was cast dead upon the shore of Cayeux, near Saint Valery. A figure of the species is given, as also several illustrations of the anatomical details of the jaws and their remarkable appendages.——Vanbeneden's *Memoire sur l'anatomie de l'Helix algira.* The differences between it and *H. pomatia* are summed up in the following particulars: 1. There are two ganglions representing the brain in H. algira, and four ganglions underneath; there is only a nervous ring without distinct ganglions, excepting perhaps a superior and inferior, in H. pomatia. 2. The real number of filaments issuing from the nervous ring is much more considerable, and the filaments more slender in H. algira than they are in H. pomatia. 3. The salivary glands surround the œsophagus in H. algira, and the stomach in H. pomatia. 4. The upper jaw or tooth is crenulate in H. pomatia, while in H. algira there is a single medial prominence. 5. The appendix of the penis, as well as the duct of the urinary bladder (so we translate "la vessie du pourpre,") is much longer in H. pomatia. 6. There is no "love dart" in the algira, and the bag which should contain it becomes a passage to the female organs. 7. The multifid vesicles are represented by a glandular body, without any appendix in the H. algira. 8. The urinary bladder is free and floating at the end of its canal in H. pomatia, and adheres to the oviduct in the H. algira.——Deshayes *sur l'estimation de la température des périodes tertiaires en Europe, fondée sur le consideration des coquilles fossiles.* An ingenious application of conchology to the determination of some interesting points in geology. Deshayes, as is well known, arranges the tertiary formations in three groups, deposited in successive periods; and his investigations in the present paper lead to the conclusion that in the first of these periods—the Eocene of Lyell—the temperature of the globe was equatorial, and probably several degrees warmer than that of the present equator; that during the second, or Miocene period, of which the deposits occupy the centre of Europe, the temperature was like that of Senegal and Guinea, while the temperature of the third or Pliocene period, at first a little more elevated than ours in the Mediterranean basin, became latterly as low as that which now exists.——Hodgson *sur les Chèvres et les Moutons sauvages de l'Hyma-*

laya. A translation from the Journal of the Asiatic Society of Bengal —— Rusconi *sur les changemens que les œufs des Poissons eprouvant avant qu'ils aient pris la forme d'embryon.* A translation from the Bibliotheca Italiana, and already noticed in our analysis of the Archives of Muller.——*Note additionnelle au memoire de* M. Duvernoy *sur quelques particularités du système sanguin abdominal et du canal alimentaire de plusieurs Poissons cartilagineux.*——*Analyse des travaux anatomiques, physiologiques et zoologiques, présentes à l'Académie des Sciences pendant le mois de Mai* 1836: viz., Marion de Proces *sur l'Orang :* Bassi *sur la Muscardine,* a disease of the silk-worm, produced by the vegetation of a species of fungus (Botrytis Bassiana) which germinates in the living caterpillar, and invariably proves fatal in its developement: Blainville *sur les empreintes trouvées dans le grès bigarré :* Jacquemin *sur l'anatomie des Oiseaux :* Bourgery *et* Begin *sur la structure des poumons : Observations sur les Fausses-Galles par* M. Vallot.

The June Number contains only one original paper, viz.—*Memoire sur la vie intra-branchiale des petites Anodontes, par* M. A. de Quatrefages, who traces, with minute and scrupulous care, the changes which the ova undergo, from the period of their entrance into the branchiæ, until the young Anodontes are entirely separated from their parent. It has been long a disputed question, by what passage the ova, on their issuing from the ovary, got access to the branchiæ, for no anatomist was able to discover any ducts or pores indisputably appropriate to such a purpose; and no wonder, since M. De Quatrefages appears to have ascertained that the ova are first expelled from the body through the anal tube, and again sucked in by the stream of water which flows in between the branchial lamellæ for the purpose of respiration. This stream deposits them in the folds of the *external* lamellæ, which are the first to receive the water. Here the ova insinuate themselves (it is not mentioned how) into the *loculæ* or cells of these organs, which are loaded with them disposed in regular series, while very few, or more commonly none at all, are to be found in the internal branchial lamellæ, or in the cloak. A moderately sized Anodon will lay, it is calculated, rather more than 14000 ova, and a larger individual not less than 20000. They are expelled at intervals of half and three-quarters of an hour in small clusters, and the process of oviposition may last for twenty-four hours at least.—Without translating the author, who is unusually concise, it would be impossible to communicate to our readers a correct idea of the changes which the ova experience in their developement, and which are carefully described and delineated, as these were observed from day to day; but the omission at present is less to be regretted, for we shall probably give a translation of the paper in a future number. We can now only remark, that the embryo young appear to remain about 125 days in the branchiæ when the mother delivers herself of her numerous progeny. The delivery occupies four or five days.—The rest of the number is filled with a translation of Mr Owen's paper on the *Entozoa,* from the Transactions of the Zoological Society; and of a paper, by Messrs Falconer and Cantley, on a new genus of fossil ruminant from the Himalaya mountains, named *Sivatherium giganteum.* The original will be found in the *Journal of the Asiatic Society of Bengal.*——In the analysis of the proceedings of the "*Academie des Sciences pendant le mois de Juin* 1836," there is a letter from M. D. Nervaux, in which he says he had seen a pair of Nightingales *(Rossignol)* remove their eggs from the nest when this was threatened to be inundated, and that the eggs, placed in

a new nest, were afterwards hatched. The anecdote is exactly similar to one recorded of the Water-hen, by Mr Selby, in the proceedings of the Berwickshire Naturalists' Club. There is also a long extract from a Memoir of GEOFFROY SAINT-HILAIRE on the Orang-Outang, written in a spirit which we greatly dislike, and with views strongly coloured by his favourite hypothesis (if he will allow us to call it so) of the unity of organization throughout the animal kingdom. This theory so fully possesses him, that it is almost impossible not to look on his observations and facts with a certain degree of suspicion; and in the conclusion to which he has been led, in the present instance, we can by no means concur. The Orang-Outang is with G. Saint-Hilaire neither man nor monkey,—a mixture of both,—and man must be classified in future with the Quadrumana. ——GUERIN has observed under the abdominal segments of the *Machilis polypoda* some little membranous sacs, which he is of opinion are organs of respiration analogous to those which are found under the abdomen of many Crustacea, and which are placed at the base of the false abdominal feet. This view of the use of the sacs in the *Machilis* appears to be strengthened by the fact, that Latreille could discover no stigmata in his dissections of that insect, which this peculiarity of structure may perhaps prove to be the type of an osculant group, connecting the classes Insecta and Crustacea.—The Number contains, lastly, a short notice of CUVIER'S *Leçons d'Anatomie Comparée*, of which new edition three volumes are published; and of FREDERIC CUVIER'S *Histoire Naturelle des Cétacés*, already reviewed in this Magazine.

II.—*Botany.*

Memoire sus les Clostéries, par M. CH. MORREN.—An essay of much interest and sterling value, but we feel that any analysis, however minute, would give a very indistinct and scarcely intelligible view of it, unless we had the aid of the numerous figures with which it is illustrated. The learned professor embraces in his essay a history of all that has been done towards a kowledge of the tribe, which has been placed among infusorial animalcules by some, by others among the algæ, while others have maintained its mixed nature—the species being animals in their origin and vegetables in their mature and old age. Morren entertains no doubt that all the true Closteria are vegetables, allied to Zygnema, but he says that infusory animalcules have been mixed with them; and of the real Closteria the species have been erroneously multiplied, by Ehrenberg in particular, from inattention to the varied forms and aspects they assume in the course of their developement. The phenomena presented during this course are minutely traced and delineated in highly magnified figures; the bearing which these appearances, and the structure of the productions, have on various intricate questions in vegetable physiology is indicated with learning and ingenuity; and the errors of his predecessors corrected. One of these relates to the reddish points observable on the extremities of the frustula regarded by Ehrenberg as eyes, but which are, we may say, proved by Morren to be vesicular granules, probably connected with the propagation of the species.——MONTAGNE *sur les plantes cryptogames récemment découvertes en France.*——*Animadversiones botanicæ nonnullæ, novorumque generum et speciorum diagnoses, auct.* F. E. L. FISCHER et C. A. MEYER.——*Extraits du* Botanical Magazine *pour l'année* 1835.—— DUPONT *sur les caractères génériques du Gypsophila saxifraga.*

Juin. MORREN continues his admirable "*Memoire sur les Clostéries.*" In one

chapter he explains how these interesting algæ are propagated by gemmules analogous to the buds of more perfect plants; and another is occupied with a detail of observations, which prove that they also produce seeds or at least seminal bodies, the result of a union between two or more individuals which connect themselves in the same way that the Zygnemæ have been long known to do. It seems that these *lowest* plants have their seasons too of semination,—the reproductive unions occurring only at two seasons of the year, viz. in April and June, but it is probable that the time will depend on the annual temperature of the place which is made the scene of observation. The gemmules are numerous and small, while the seeds are very few in number and large, so that were the Closteria to be left dependent on the latter solely for their diffusion or existence, they would speedily become extinct, *two* individuals being required to produce *one* fertile seed. No single Closterium can form a seed of itself; a pair is necessary, and yet each element of this pair, enclosing all the organic conditions necessary to reproduction, is in fact an hermaphroditical being. In each there are two utricles with reddish spherules—the male organ,—and two masses of chromules—the female organ. If it remain single, the spherules fecundate the divisions of these parenchymatous masses, which become then the gemmules; if it unites itself to another individual, the spherules fecundate the whole and undivided masses of the same chromule, which, by a force acting from the circumference to the centre, is raised to the condition of a seed. Morren concludes his paper with the following corollaries—" 1°. Il y a des êtres chez lesquels les organes de la nutrition forment seuls et à-la-fois les organes reproducteurs et les êtres reproduits."—" 2°. La formation des embryons végétaux, dans les algues, depénd d'une concentration de la matière organisée."—" 3°. Les embryons végétaux chez les algues, se formant sous l'influence d'une force organisatrice qui procede de la circonférence au centre."——Montagne *sur les plantes cryptogomes récemment découvertes en France.*——Spach, *Conspectus Monographiæ Hypericacearum.* The following table exhibits a distribution of the British species according to Spach's views:

Tribus Desmostemoneæ—Sectio Elodeineæ.
Genus *Elodes:* sp. *E. palustris.*
Tribus Hypericeæ—Sectio Hyperineæ.
Genus *Hypericum:* sp. * Holosopalum—*H. humifusum. H. quadrangulum.* * * Milleporum—*H. perforatum. H. dubium?* * * * Adenosepalum—*H. pulchrum. H. montanum.* * * * * Drosocarpium—*H. Carbatum.*
Tribus Hypericeæ—Sectio Androsæmineæ.
Genus *Androsæmum* sp. *A. officinale.*
Genus *Eremonthe*: sp. *E. calycinum.*

The remaining articles of the number consist of short reviews and extracts from the " Flora," and do not require in consequence to be indicated in this place.

The Magazine of Natural History. Conducted by J. C. Loudon. Vol. ix. Nos. for Nov. Dec. (Continued from p. 403.)

I. *Zoology.*

Westwood on the Nomenclature of Natural History, p. 561. We are at the very antipodes with Mr W. on this subject, which it appears to us has been

anything but elucidated by the recent discussions to which it has given rise in England.——N. Wood's Reply to C. J.'s Remarks on the "British Song Birds," p. 566.——On the Habits of the American Flying Squirrel, (Pteromys volucella, *Cuv.*) by D. W. C. p. 568. A very pleasing paper.——Berkeley on the Occurrence of Dreissena polymorpha, *Vanbeneden*, in Northamptonshire, p. 572.——Blyth on the Birds observed, during the last four years, in the Vicinity of Tooting, Surrey; with Remarks on their comparative Numbers and Distribution, p. 622.——Clarke's Remarks on Lepas anatifera, p. 638.

In neither Number is there any original Botanical communication, excepting what is to be found among the "Short Notices," which are as various and numerous as hitherto. Of these, there is none we have read with so much pleasure as the Anecdotes of the late Mr Purton, author of the Midland Flora; and we do hope that, in the New Series of this Magazine begun with the present year, an effort will be made, by the industrious Editor, to supply us with similar, or rather more copious, notices of such lovers of Natural History as may be annually summoned to that bourne whence no traveller returns.

Entomological Magazine. London, October 1836.

The contents of this number are less interesting than usual, and the first eight pages are filled with a continuation of the "Wanderings and ponderings of an Insect Hunter," which, however, have nothing to do with Entomology.——Art. 11. Essay on Parasitic Hymenoptera. By A. H. Haliday, M. A., continued from page 59.——12. Some Scraps by the author of the Delta letters.——13. Notes on Diptera by Francis Walker. These record the habitats of several rare British species.——14. Researches on the insects injurious to the vine, known to the ancients and moderns, and on the means of preventing their ravages. By M. Le Baron Walkenaer, extracted from the Annales de la Société Entomologique de France. The first section only of this essay, containing the critical examination of the names given by the ancients to insects injurious to the vine, is given; the remainder to appear in a subsequent number.——15. Additional notes on the order Thasynoptera. By A. H. Haliday, M. A.—— 16. Notes upon Diptera, and characters of some undescribed species of the family Muscidæ. By A. H. Haliday, M. A.——17. Verses on Spring.——18. Thoughts on the Study of Entomology.——19. A list of rare insects taken at Darenth Wood. By Members of the Society of Practical Entomologists, from June 20th to July 11th, 1836.——20. Description of the Genera and Species of the British Chrysididæ. By H. E. Shuckard, M. E. S.——21. Notes on the Butterflies questionably British.——22. Observations on the circulation of blood, and the distribution of the Tracheæ in the wings of *Chrysopa perla*. By J. S. Bowerbank. An interesting paper, accompanied by a plate of the wing of the insect and its blood-vessels.——23. Proceedings of the Entomological Club.——24. List of captures at Lyndhurst and Ryde. By Sir John Lighton, and the Rev. G. T. Rudd. Among the Coleoptera are three distinct new genera of Staphylini, and Cicindela Germanica, &c.——25. Pith of Periodicals.

INTELLIGENCE.

ZOOLOGICAL.

Hersilia, Savigny.—This genus of spiders is remarkable, 1*st*, for having three joints in the tarsus, which is an anomalous fact in its class, and 2*dly*, for the smoothness of the claws, for the claw of every other known spider is toothed or pectinated. These curious deviations from the ordinary structure are undoubtedly accompanied with corresponding peculiarities in the habits of the species, but with these habits we are unacquainted. Three species are known, one a native of Egypt (Cairo,) the others of India, having been sent from Bombay, and the coast of Malabar.—*Guérin, Mag. de Zoologie.*

Pleurotuchus, nov. gen.—Characterized at p. 142.—Mr J. E. Gray informs us that this is synonymous with his genus *Cicigna* in Griffith's edition of the "Animal Kingdom," and with the *Pteropleura* of Weigmann.—Edits.

Upupa Epops.—A beautiful specimen of the Hoopoe was shot near Coylton in Ayrshire on the 16th of October 1836.—*P. W. Maclagan.*

Falco rufipes.—A fine mature male was shot on the Durham coast between South Shields and Marsden rocks, in the middle of last October. It was in company with another, which unfortunately escaped. The stomach was filled with coleopterous insects.—*Albany Hancock.*

Motacilla neglecta.—A male specimen of this interesting species was shot a little west of Newcastle on the 1st of last May. It was with another, probably a female; and from the lateness of the season it is likely they might have bred in the neighbourhood. When my brother was in Norway he met with several individuals of this species, but procured only one. It appears to be the common bird of that part of Europe, and is so perhaps over the whole continent, the *neglecta* being the species described by the continental writers as the *flava* of Ray.—*Albany Hancock.*

Regulus ignicapillus.—An individual of this beautiful little bird was taken on the rigging of a ship five miles off the Norfolk coast in the early part of last October.—*Albany Hancock.*

Larus minutus.—A specimen of this bird, in the first plumage, was killed at the mouth of the river Tyne last September.—*Albany Hancock*, Nov. 21, 1836.

Hipparchia blandina.—Five specimens were captured about the 21st of August 1836, at the foot of Whernside in Craven, Yorkshire, by Abraham Clapham, Esq., a pair of which were presented by him to the museum of the Leeds Phil. and Lit. Society, and one to myself.—*Henry Denny.*

Luminosity of the Sea and Cholera.—From 1810 M. Surivay had observed

the phosphorescence in our seas to be exhibited with the same characters every year during the summer season, but it was interrupted in the waters of the channel (De la Manche) when the cholera morbus prevailed at Havre and its vicinity in the month of May, June, and July 1834. * Several naturalists of the French capital, who are in the habit of visiting our harbour from season to season, and who had been observant of the phenomena, confirm this remarkable fact; and the whole city is witness to the sudden and very general mortality of the fishes kept in our preserves of brackish water which then occurred. All the eels and flat fishes came to the margins and died. M. Surivay examined with the microscope some drops of the water become a little putrid, and he ascertained that its slight blood-tinted colour depended on the increase of different kinds of infusory animalcules.

The diffused phosphorescence observable in our seas during the summer, M. Surivay attributes to the prevalence of a minute species of medusa (*Noctiluca miliaris,*) which he has described and figured in *Guerin's Mag. de Zoologie.*

Parmacella, Cuvier.—MM. Webb and Vanbeneden have attentively examined the American mollusca reputed to belong to this genus in the rich collection of the late Baron de Férussac, and the result is the establishment of a new genus (*Peltella*) for their reception, the organic differences between them and those of the old continent being so considerable as to justify their separation. This division besides has the advantage of fixing in a precise manner the geographical distribution of the two genera. The Parmacellæ appear to belong more particularly to Northern Africa, one species only having been met with at the western extremity of Europe, and in one of the warmest regions of the Iberian Peninsula. We may then presume, that when the *Limacidæ* of the north of Africa are better known, the group to which they (the Parmacellæ) belong will present a series of species similarly conformed, and replacing in those climates the slugs of our temperate regions. The European species is minutely described and figured in a late No. of *Guerin's Mag. de Zoologie.* It was found on the hills of Alcantara behind Lisbon, feeding on the young shoots of *Cochlearia acaulis,* and is characterized as follows:

Parmacella Valenciennii, corpore toto fulvo, reticulatim rugoso; concha scutello obvoluta, tenui, diaphana, fragilissima; spira rudimento instructa, basi motaria amditu sinuata.—*Webb and Vanbeneden in Mag. de Zoologie.*

On the sexes of some Crustaceans.—It is to be observed that, in regard of sex, the Cancroïdea differ not only in being male and female, but there are also barren or spurious females, of which the broadly-trigonate abdomen is narrower than in genuine females, although broader than in the males. These are not to be confounded with young females whose abdomen, as in the Majaceæ, is flatter than in the adults, for of several species there are both barren and fruitful individuals of the same age. The Cancroïdea and Matutoïdea are hitherto the only families in which these sterile females have been noticed. *Portunus* (Neptunus) pelagicus, sanguinolentus; (Amphitrite) gladiator, hastatoides; (Charybdis) miles, 6-dentatus; (Thalamita) truncatus; *Ocypode* (Macrophthalmus) japonica; (Helice) tridens; *Grapsus* (Erischeir) japonicus; (Grapsus) marmoratus have afforded

* The exact year, as well as the name of the author's place of residence, is omitted in the essay from which this notice is extracted.

specimens of them. The form of the abdomen of the spurious females is trigonate in all the Portuni, but in P. sexdentatus the joints are arched on the side, and constricted at the apex and base; in Oxypode and Grapsus, differing from the former, it is wider than the half of the breadth of the sternum, while of a genuine female it occupies the whole breadth, and the apical joint is trigonal not dilated. The ovigerous appendages, or, as their use would warrant us in calling them, the spurious feet, are fringed with long hairs in the females, but on the contrary in the neuters they are either smooth or very shortly hairy. The organs of the body agree mostly with those of the females, but Portunus miles offers a difference in the claws, and P. truncatus both in the claws and front.—*W. De Haan in Siebold's Fauna Japonica. Crustacea*, Part ii. p. 36.

Arvicolæ.—M. Edm. de Selys-Longchamps has published a short monograph of the species of *Arvicolæ* found in the vicinity of Liege, and has given the characters of two species which he considers new and distinct. We add the descriptions in his own words, to serve for comparison with the species of Britain.

"*Campagnol souterrein, A. subterraneus, Longch.*—Oreilles médiocres, entourées à leur base de poils qui se font paroitre cachées quand l'animal est en vue. Yeux tres-petits (une fois plus petits que ceux du Mus arvalis, Lin.) Queue d'une longeur égale au tiers du corps; bicolore, cest-a-dire noir en dessus et blanchatre en dessous (du moins dans les individus adultes,) pieds couverts de poils courts d'un gres noiratre, pelage d'un gris noiratre plus ou moins foncé en dessus, d'un gris blanchatre en dessous. Dens incessores d'un jaune foncé chez les vieux. Longeur du corps 2 po. 9 l.; de la queue 1 po. 2l.; totale 3 po. 11 l. 15 Vertebres à la queue; 13 paires de cotes—Ce campagnol se trouve sur la bords du Geer, de l'Ourthe, &c. Il frequente les jardins à legumes, situes dans les terrains un peu humides peut-etre aussi les prairies. Il vit toujours souterrain.

"*Campagnol roussatre, A. rufescens, Longch.*—Queue d'un longeur egale à la moitie du corps; bicolore, cest-a-dire* noiratre en dessus, blanche en dessous. Yeux prominens. Oreilles assez longues, pieds blanchatre, pelage d'un roux ferrugineux assez vif sur le dos. gris cendré sur les côtes, blanchatre en dessous. Longeur du corps 2 po. 9 l.; de la queue 1 po. 4½ l.; totale 4 po. 3 l.—16 vertebres a la queue, 13 paires des cotes—cette description n'a été fait que d'apres 2 individus pris dans un petit bois à Longchamps sur Geer."—L'Instit. 16 Novr. 1836.

Bones of the Camel found in a fossil state.—M. de Blainville has announced to the Royal Academy of Sciences at Paris, that he has learned from an individual who has lately returned from India, that the fossil remains of the camel have been found in the deposits of the lower ranges of the Himalayan mountains. The remains alluded to consist of a cranium, which was found in a very hard sandstone about two miles from Ramghur, and six from Pingon. This head, almost entire, appears to have belonged to the Dromedary, or single-humped camel. There has been also discovered in the same locality, the anterior part of the head of an animal intermediate between the *Anoplotherium* and *Paleotherium* of the Paris Basin. And the tooth of a species of Mastodon, allied to

* Mr Bell quotes this as synonymous with *A. pratensis*, Bail.; *A. riparia*, Yarr.

the *M. angustidens*, Cuv., and which, if this opinion should prove correct, would show that the remains of the latter animal had been found in three quarters of the world, Europe, Asia, America.—*Instit. 9th and 16th Novr.* 1836.

Migratory Birds in 1836.—In the northern parts of England the effects and influence of season upon the movements of migratory birds, has been strongly exemplified during the present year. The cold and ungenial weather during the months of March, April, and May, delayed the arrival of most of our summer visitants from ten to fourteen days beyond the average period of their first appearance, as deduced from a journal annually kept for more than fifteen years.

It was also generally remarked that they were much fewer in numbers, and that some species were altogether absent in localities where in previous years they had been abundant.

The departure of the *Sylviadæ*, as well as the *Hirundinidæ*, on their equatorial movement, has also been unusually early, no doubt strongly influenced by the low temperature of the season.

Before the 1st of September the most of the Warblers had disappeared, a few individuals of *Sylvia trochilus* alone remaining till the 8th or 10th of that month, and after the 20th of September, more than a month before their accustomed time, the *Chimney Swallows* and *Martlets* had entirely disappeared. It is worthy of remark, that the Crossbill, whose summer migrations extends to higher latitudes, were observed in Northumberland as late as the 2d of May, at which time the eggs in the ovary of the female were some of them as large as peas.

The Fieldfare (*Merula pilaris*) one of our winter visitants, arrived in large flocks on the 24th and 25th of the present month, being a fortnight or more before the average time of its appearance.

An extraordinary deficiency of the insect tribe, particularly Coleoptera and Lepidoptera, has been generally noticed throughout the north of England and Scotland, during the spring and summer just passed.—P. J. S.

Additions to the Entomology of the Edinburgh district.—The following coleopterous insects have been captured during the two last seasons; and as they are not contained in the Entomologia Edinensis of Messrs Wilson and Duncan, some record of them will not perhaps be considered devoid of interest.

Haliplus melanocephalus. Braid marshes. The species is described by Stephens as having the interstices of the striæ on the elytra impunctate; my specimens have a few scattered punctures, but differ in no other respect.

Hydroporus frater. Reservoir above south Queensferry, and in the fish-ponds at Newliston.

——— 12-pustulatus. Reservoir at south Queensferry; a single individual.

Hydrobius melanocephalus. Braid marshes.

Sphæridium scarabæoides—bipustulatum.

Trichopteryx minima. Wall-top, Dalmeny park.

Ips ferruginea. Wall-top, Dalmeny Park, two specimens only.

Hister neglectus—bimaculatus—nitidulus; all near south Queensferry.

Onthophagus ovatus. King's Park, in dung. This is a very interesting addition to our Fauna; a few specimens were taken early in 1836 by Mr R. N. Greville. It is the only species hitherto found in Scotland.

Aphodius contaminans.

Telephorus ochropus. Roslin.

Acalles ptinoides. Roslin. The Rev. W. Little and myself captured one specimen each.

Hypera fulvipes. South Queensferry. It seems really distinct from H. nigrirostris.

Apion pomonæ; rare. A. cæruleopenne; Queensferry; a single specimen. A. carduorum—sulcifrons—vorax—foveolatum.

Rhagium inquisitor. Roslin.

Haltica flava. Dalmeny Park.

Thyamis pallens—Pulex.

Macrocnema hyoscyami.

Mantura semiænea.

Chætocnema concinna.

Chrysomela pallida. A considerable number of specimens were taken at Roslin by the Rev. W. Little and myself, by beating the hazel bushes. C. hyperici. Juniper Green, on Hypericum hirsutum.

Phædon aucta.

Coccinella humeralis. On palings in the Meadows, along with C. dispar and variabilis.

Quedius pyrrhopus—picipennis.

Philonthus maculicornis,—Watsoni.

Othius pilicornis.

Gyrohypnus affinis—punctulatus.

Lathrobium rufipenne.

Oxytelus rugosus—nitens.

Stenus oculatus—cicindeloides?—unicolor—picipes?—gonymelas?—Aceris—canaliculatus?—lineatulus?—lævior?—lævis—pusillus; besides several individuals that I cannot refer to any species described by Stephens.

Lesteva testacea. Roslin.

Tachinus apicalis.

Tachyporus lateralis.

Conurus cellaris.

Bolitobius apicalis.

Among the rarer insects described in the Entomologia Edinensis, a single specimen has occurred of Microsaurus lateralis.

Edinburgh, Dec. 16. R. K. Greville.

BOTANICAL.

Agaricus cochleatus, Eng. Fl. v. ii. p. 69.—"Inverary" is the only recorded station for this rare Agaric in Scotland. It may therefore be worth while to mention, that I gathered it in great perfection, on November 17, 1836, in the plantation around Foulden House, Berwickshire.—G. J.

Additions to Cooper's Flora Metropolitana.—*Silene otites.*—This uncommon plant, in the vicinity of London, was discovered in Charlton Chalk-pit, Kent, last summer, by Miss S. Berkeley, Busk, and Finch, from whom I possess specimens.

Crocus aureus.—I also found this not very common species in the neighbourhood of London, in Charlton Wood, Kent, in company with Messrs Chatterley and Lee, who also met with it in a meadow in Battersea Fields. The locality

in Charlton Wood is rather complicated, but I will give as good a description as possible. When you arrive in the lane on left hand just out of Charlton from Blackheath, get over the style by the first house on the right hand, and then about fifty yards on your right, get over the hedge into a valley, where there is a pond; lower down than the pond *Crocus aureus* is found on both sides plentifully in the proper season. This species is not mentioned in Lindley's Synopsis.

DANIEL COOPER.

Allan Cuningham.—This gentleman has been appointed Curator of the Sydney Botanic Garden in the stead of his brother, Richard Cuningham, who met an untimely end when exploring the interior of Australia. Mr Cuningham sailed from London in October last.

Marsiliaceæ.—M. Auguste de Saint-Hilaire has communicated to the Royal Academy of Sciences of Paris, a notice on the structure and developement of the reproductive organs of a species of *Marsilea* found in the vicinity of Agde. These observations have been made by Esprit Fabre, a gardener in the neighbourhood, and are sent to St Hilaire by M. Dunal, who has applied to the plant the name of its discoverer.

In *Marsilea Fabri*, there is seen at the base of each leaf a very short horizontal peduncle, to which a capsular involucrum is attached for the whole length, which the adherence of the peduncle makes appear as if sessile. If the involucrum be cut in two, the processes are seen in each half, which in another species have been taken for the divisions, and which separate the involucrum into the cells where the small globular or elliptical bodies are contained. The involucrum opens in two valves, and if one of them be detached, the peduncle is perceived articulated; and in the interior of the involucrum that part of the pedicelle above the articulation gives rise to ramifications which cover the reproductive apparatus. It is these which have been taken for the divisions, the ramifications subdivide themselves, and their extreme branches being delicate, are termined in a kind of small ears or heads.

From the opened involucrum springs a mucilaginous ring, which bears six or seven sessile ears, (those mentioned above.) The ring enlarging carries with it the ears, and breaks the communication between them and the *receptacle*; soon after one extremity of the ring detaches itself from the involucrum, is straightened and now becomes a peduncle with a naked extremity, furnished latterly with sessile ears. These are composed of two kinds of bodies, wedged against another, and arranged spirally, these M. Fabre regards, the one as the *anthers*, the other as the *ovules*.

The ovules, of the number of ten or fifteen in each ear, are small bodies terminated at one of their extremities by a narrow yellow nipple surrounded by a sort of prominent hood, which the nipple passes. The interior of these bodies is filled with a liquid in which numerous granules swim. The terminal nipple is always turned towards the anthers; these are small bodies found in a membranous bag, in which there are numerous grains of pollen, which when crushed under the microscope, are seen to throw out spermatic granules of great delicacy.

But it may be asked, on what proofs do MM. Fabre and Dunal assert, that the bodies which they name *ovules*, are fecundated by those which they call *an-*

theres? M. Fabre has enclosed the antheres and ovules in separate vessels, and both have remained without change till decomposition commenced. On the contrary, when these bodies were placed in the same vessel, he perceived the divisions of the anthers to burst, and the grains of pollen to be carried around the nipple of the ovaries; he saw the ovules detached and fall to the bottom of the water; in short, he saw a little stem implanted in the earth by its extremity spring from the nipple, soon after a fine thread has risen from its extremity, (a thread which was in reality a cotyledon), and other leaf stalks have successively spread, terminated by two, three, and even four leaflets.

The conclusion which M. Dunal has thus arrived at, after comparing these curious facts, with what had been previously written regarding the Marsiliaceæ is, that they should be removed from the Class Cryptogamia and placed among the Phanerogamous plants.—*L'Inst.* 16*th Nov.* 1836.

Pilularia globulifera.—The general description of the involucre of Pilularia, and the very different seed-like bodies therein contained, is familiar to most botanists, and is for the most part correctly given by modern writers; but the nature and functions of those bodies have been frequently the subject of contradictory statement, some authors attributing to the smaller, the office of stamens, and to the larger, that of pistils, whilst others have denied both, and, to avoid a difficulty, have imagined that the smaller are abortive seeds.

The well-marked distinction in structure, size, shape, and situation, within the involucre, in all stages of growth of these bodies, and the smaller or granules not being observed in many experiments to make the least effort at germination, are grounds sufficient to justify the conclusion that they are not abortive seeds, but that they perform some peculiar office, and the probability of that office being analogous to that of anthers in Phænogamous plants. The result, too, of Mr Dickie's experiments* shewing the presence of starch and a fluid resembling a fixed oil its properties in the true seeds, or "thecæ," as they have been called, (which is evidently an improper term since each "theca" is one entire seed, having one germen, and producing but one plant) is a valuable addition to the distinguishing characters of these bodies. To ascertain the manner of germination, some seeds of Pilularia were placed in water in watch-glasses—seeds by themselves, and seeds with granules in separate glasses—and in a few days the seeds in both vessels were swollen about the apex,† which became of a blackish-brown colour, and a green point soon presented itself through the apex in a line vertical to the axis of the seed, and became a leaf, which having attained about half an inch in length, a white radicle appeared in a directly opposite line. When the root had attained rather more than half an inch in length, the young plants withered and died, probably from exposure to too much light, and being deprived of other advantages which soil would afford. Accordingly, a glass dish was nearly filled with mud and water, and covered with a bell glass to prevent evaporation. A considerable number of seeds were placed on the mud, and some buried a little below the surface; germination commenced in a few days; but in this experiment the first leaf proceeded at right angles to the

* See No. IV. of this Magazine.

† The upper part of the figure in Mr Dickie's paper represents the apex.

axis of the seed. The leaf in this experiment also preceded the radicle. In a week or more, a second leaf appeared, and in about the same length of time a third with a rudiment of a horizontal stem proceeding from the point of union between the radicle and first leaf. The seed or rather the external coriaceous covering adhered for many weeks. The number of leaves and roots previous to the developement of the stem, is various, in different individuals. The first leaf is straight from its earliest appearance, but all the future leaves are slightly coiled, as in the young fronds of ferns. It is observed that in all cases the embryo proceeds from the same determinate point of the seed. The circulation of the sap seems to be carried on by Exosmose and Endosmose, as the substance of the leaves and stem consists chiefly of elongated cells of various dimensions, their extremities being closed by partitions; but in the centre of the leaf there is a branch of vessels which appear to be ducts of very minute size. No spiral vessels could be detected. Professor Lindley has observed ducts in Marsilea. The developement of the seminal or first leaf before the radicle is analogous to the germination of some of the Cyperaceæ, as according to Mirbel in *Scirpus Romanus, sylvaticus, &c.*

The habit of Pilularia also resembles that of some of the same order. When it is considered that so many of the essential characters of the Cellulares do not apply to the Marsiliaceæ, as in the subject of the above observations, the embryo proceeding from a determinate point of the seed, the vascularity of the stems and leaves, there being no other order of the Cellulares having true stems, and the approximation to a sexual apparatus, it seems to point to the conclusion that this order is intermediate between the Monocoteledones and the Cellulares, or at least should stand first among the latter as Mirbel and some other Continental botanists have placed it.—*Lloyd.*

Contributions to the Flora of Ayrshire.

Teesdalia nudicaulis. Sandy fields, near Prestwich.
Lepidium campestre. Near Dunure Castle.
" Raphanus maritimus. Ailsa Craig—Mr Jas. Smith."
Silene Anglica. Sandy fields, near Prestwich—rare.
Spergula saginoides et subulata, Carrick-hill—very rare.
Radiola melligrana. Prestwich Moor, in many places.
" Lavatera arborea. Ailsa Craig—Mr J. Smith."
" Hypericum montanum. Banks of the Doon, near Cassilis—Mr Jas. Smith."
Hypericum elodes. Lochfergus—Irvine—not uncommon.
" Geranium columbinum. Near Maybole—Mr J. Smith."
Trifolium ornithopodioides. Shore near the mouth of the Doon, where seaweed has been—Dr G. M'Nab.
Ornithopus perpusillus. Sandy fields, frequent, as at Prestwich.
Lythrum salicaria. Carrick-hill, &c.—wet places, very frequent.
Sedum telephium. Rocks near Dunure, and elsewhere on the shore—frequent.
Sedum anglicum. Rocks, especially on the shore—common.
Rhodiola rosea. Rocks on the shore, south of the Heads of Ayr.
Saxifraga aizoides. Rarely with the preceding.
" Saxifraga hypnoides. In a glen, near Dalmellington—Dr G. M'Nab."
" Carum verticillatum. Near Dalrymple, and elsewhere—Mr J. Smith."

Eryngium maritimum. On the shore—abundantly.
Inula helenium. Dunure Castle.
Hypochaeris glabra. Sandy fields, near Prestwich.
Lobelia dortmanna. Not unfrequent in lochs, as at lochs Martnaham and Fergus.
Jasione montana. Pastures and heaths—abundant.
" Andromeda polifolia. Shewalton Moss—Mr J. Smith."
Convolvulus soldanella. Shore north of Ayr in plenty.
Lithospermum maritimum. Near Dunure Castle.
" Lycopus Europæus. Chapelton loch, and many other places."
Lamium intermedium. Field near the mouth of the Doon—Dr G. M'Nab.
Waste ground in and about Ayr—frequent.
Scutellaria galericulata. Marshy places—frequent.
" Lysimachia vulgaris. Martnaham Loch—Mr J. Smith."
Centunculus minimus. On Prestwich Moor with Radiola millegrana, where the turf has been removed.
Polygonum aviculare, var. B. maritimum. On the shore—common.
Scilla verna. Near Dunure Castle—abundantly.
Potamogeton heterophyllus, without floating leaves. In Martnaham Loch.
" Ruppia maritima. Near Troon Harbour—Mr Smith."
Juncus maritimus. Troon Harbour.
Scirpus Savii. Near Dunure Castle—Dr G. M'Nab.
Carex limosa. Knockdon Loch.
" Calamagrostis Epigejos. Banks of the Doon, 1½ mile below Patna Bridge —Dr G. M'Nab."
" Elymus arenarius. Coast, four miles north of Ayr, sparingly—Mr J. Smith."
" Lycopodium inundatnm. Shewalton Moss—Mr Smith."
" Cryptogramma crispa.
" Hymenophyllum Wilsoni. } Glen near Dalmellington—Dr G. M'Nab."
" Asplenium viride.
Asplenium marinum. Maritime rocks—frequent.

PHILIP W. MACLAGAN.

Spiranthes autumnalis—I found plentifully in 1835, in the middle of the large sand pit leading out of the lower road between Greenwich and Woolwich. This plant is sometimes not to be observed for four or five years together, and then to flower regularly for a short time.—DANIEL COOPER.

Leucojum æstivum.—A meadow of this beautiful plant is to be seen at the bend of the river Thames, directly opposite to the Plough Tavern, Blackwall.—DANIEL COOPER.

Elaphomyces granulatus, Eng. Flor. v. ii. p. 306.—In a beech plantation near Foulden, Berwickshire, attached to the radicles of the trees. This, I believe, is a novelty to the Scottish Flora. It were desirable that the characters which separate this from the *Elaph. muricatus* were more tangible than they seem to be in Mr Berkeley's descriptions.—G. J.

Spartina glabra.—Specimens of Spartina glabra, a genus new to the British Flora, were presented to the Linnæan Society (Nov. 1, 1836,) by Dr Brom-

field, by whom the plant was discovered during the past summer on the muddy banks of the river of Southampton, growing in great abundance, intermixed with *Sp. stricta*. The species had been previously found only in North America. It is now in such plenty in the Southampton station, that, if really introduced by ballast or other means, it must have been long since naturalized.—Phil. Mag. Jan. 1837.

MISCELLANEOUS INTELLIGENCE.

Medico-Botanical Society of London,—Earl Stanhope, president, in the chair.—A communication by Sir Robert Kerr Porter, forwarded through Sir Henry Halford, on the *Cinchunchulli*, or Ionidium parviflorum, was read. The paper embraced a botanical description of the plant, and the reports furnished by the medical men to the Venezuelan government on its use as a therapeutic agent, in the treatment of that scourge of the tropics, the Elephantiasis tuberculata. The celebrated Mutis gave the name Viola parviflora to the cinchunchulli, in which he was followed by Persoon, but Ventenat considered it an Ionidium, and Dr Bancroft of Jamaica, who has recently published a paper on the subject, gave it the name of Ionidium Marcucci, in honour of M. Marcucci, a gentleman who underwent much toil and danger, when searching for the plant. It is found at the foot of the Chimborazo, at Cuença, Canar, and Puraçé, in the canton of Popayau: the root is the part employed, and its sensible effects are, nausea, vomiting, perspiration, and diuresis. Several cases were narrated at some length, in which much advantage was derived from the use of the cinchunchulii, but it unfortunately happened, that in all those treated by medical men, the quantity of the drug in their possession was too small to enable them to effect a cure, supposing the remedy capable of producing it.

Botanical Society of London.—In our last Intelligence (page 415,) we noticed the institution of a Botanical Society in London. The following prospectus has since been sent to us by the attention of Mr Heathcot.—Societies for the cultivation of Natural History generally, for the cultivation of Horticultural Botany particularly, for the cultivation also of Medical Botany, are already in existence in this metropolis, but no Society especially devoted to general Botanical Science has hitherto been instituted. The advantages of a Society of the last-mentioned description, will probably be admitted by every one who has the slightest acquaintance with Botany, and will without doubt be acceptable to all who are desirous of obtaining information on the various subjects which will necessarily come under the consideration of such a Society.

A number of gentlemen, having seriously considered the many desirable results which such a Society cannot fail to produce, and having fully decided upon the necessity, have instituted, "The Botanical Society of London," for the promotion of the following objects, viz.—

I. To concentrate the labours of individual Botanists, by holding stated Meetings in some central situation, with as little expense as possible to the Members, where each may communicate his information, and receive that of others in return.

II. To read original papers, and translations of Foreign Memoirs of importance, on Botanical subjects, at the Ordinary Meetings of the Society.

III. To examine and describe all plants that have not hitherto been accurately described, and to communicate the results at the Ordinary Meetings of the Society; and by a separate examination of the same plants, by different persons,

produce a series of accurate descriptions of genera and species, which could not possibly have been done without such a co-operation of scientific botanists.

IV. To publish these descriptions and other transactions, as often as may be deemed expedient.

V. To form Herbaria of British and Foreign plants, for the reference of the Members, and exchange with other Societies or individual collectors, and thus be the means of producing many valuable Herbaria, which otherwise would not have been completed or even commenced.

VI. To form a Library and Museum.

This Society consists of Resident, Corresponding, Foreign, Life, and Honorary Members.

The Annual Subscription of Resident Members is fixed at One Guinea, of Corresponding Members at Half-a-Guinea, and after the Society has been established Six Months, each new Member of these two Classes shall pay an admission fee of Half-a-Guinea.

Another prominent feature of this Society is, that Ladies are eligible as Members, it being well known that there are many who have devoted their attention with success to this delightful study, and whose occupations often leave them much leisure for observation and research.

The following officers have been appointed; the names of the others when elected will be published in a subsequent Prospectus.

Council.

George E. Dennes, Esq. 5, Great Vine Street, Golden Square.
Joseph Freeman, Esq. Stratford, Essex.
Charles Johnson, Esq. Professor of Botany, Guy's Hospital.
Dr Macreight, Professor of Botany, Middlesex Hospital.
Henry Ashton Meresom, Esq. Guy's Hospital.
W. H. White, Esq. 4, Worship Square, Finsbury.

Treasurer.—John Reynolds, Esq. 23, Chadwell Street, Islington.

Curator.—Daniel Cooper, Esq. 82, Blackfriars Road.

Honorary Secretary.—W. M. Chatterley, Esq. 82, Blackfriars Road.

The Society will hold its Meetings every alternate Thursday.—The Meetings will take place on

Thursday,	November	3.	At their rooms Adelphi Chambers, 11, John Street, Adelphi, next door to the Society of Arts.
„	„	17.	
„	December	1.	
„	„	15.	

N.B.—Communications may be addressed (post paid) to the Secretary as above, or at Adelphi Chambers.

The second meeting of this Society took place on Thursday evening, November 3, at the Crown and Anchor, Strand, J. E. Gray, Esq. F. R. S. in the Chair. The minutes of the last meeting were read and confirmed. Several presents to the Library and Herbarium were also announced. The Society then fully considered the necessity of taking apartments, plans of which were laid before the Members by the Council, when they decided upon holding their future meetings at Adelphi Chambers, 11, John Street, Adelphi, next door to the Society of Arts. It was proposed and carried unanimously, that the anniversary meeting be fixed for the 29th of November, the birth-day of our illustrious countrymen and botanist, John Ray. This was received with most

enthusiastic applause by a crowded assembly of both ladies and gentlemen. Mr Daniel Cooper, author of Flora Metropolitana, &c. the founder and curator of the Society, read an interesting paper on the effects of light upon some of our domestic plants, which excited great interest, more particularly with the ladies. Mr D. Cooper also related the results of some interesting experiments on the imbibition of coloured fluids by the roots of plants, and produced many interesting specimens of general interest to the vegetable physiologist. There were several eminent metropolitan botanists present, among whom were Sir W. Kelburn, Dr MacIntyre, Dr Lewis, Mr Charles Johnson, Mr D. Cooper, &c. &c. The thanks of the Society having been expressed to Mr D. Cooper for his interesting papers, the chairman then stated that the next meeting would take place on Thursday, November 17th, at Adelphi Chambers.—A. Heathcot.

Berwickshire Naturalists' Club.—It may safely be said, that at no period in the history of our country has a love for physical science in general been more widely diffused than it is at present; and certainly at no previous period was it ever more zealously or successfully cultivated. In the department of Natural History in particular, the truth of this statement must be obvious to every one at all acquainted with the subject. The very circumstance, indeed, of the establishment, within a very limited number of years, of so many associations in all parts of the island for the prosecution of this delightful and most rational study, is of itself a sufficient proof of the interest and attention with which it is now almost invariably regarded. And to these associations it doubtless is that we are, in a very great measure at least, to ascribe the present flourishing state of this science. The Berwickshire Naturalists' Club is one of these late associations, having been formed between five and six years ago; and as it is now beginning to be pretty extensively known, and is in its plan or constitution somewhat different from almost every society which has been instituted for a similar purpose, a brief notice of its rise and progress may not be uninteresting.

While other societies contented themselves almost entirely with reading and hearing communications, and confined their meetings to one particular town or city, it suggested itself to one or two Berwickshire naturalists who were in the habit of occasionally meeting each other in their rambles after nature's beauties, that if a county or district association could be formed, and the attention of that association could be given exclusively to the natural history of its own district, meeting for that purpose periodically in different parts of the district, and devoting its attention as much to actual excursions or out-of-door work, as to the reading and discussing of papers and communications, not only would the natural phenomena and productions of the district be more minutely and successfully investigated, but, by the same means, a greater number of facts, and a greater amount of information, would be added to the general stock of natural knowledge daily accumulating throughout the land. No sooner was the suggestion or proposal communicated to other companions in the same pursuits, than it was at once and cordially approved of; and the result accordingly was the formation of a district society under the title of the Berwickshire Naturalist's Club, which held its first meeting in the neighbourhood of Cockburnspath, September 22d 1831. Though at the first meeting only nine gentlemen were present, yet it is gratifying to be able to add, that the number of members now amounts to forty; and it is equally pleasant to be able to state, that the same harmony of feeling, the same

zeal and ardour in the pursuit of nature which led to the institution of the club, and characterized its first meetings, still continue to animate and to characterize every succeeding one. The object of the club being to gain as accurate and complete a knowledge as possible of the natural productions of the county (and its immediate neighbourhood), and its constitution being partly scientific and partly social, its meetings, exclusive of the winter meeting (which is always at Berwick,) are held four times a-year in different parts of the district; the members meeting at breakfast, devoting the next five or six hours to an excursion through the most interesting parts of the neighbourhood, and then assembling to a comfortable dinner, after which, communications and notices, both verbal and written, are received and listened to; discoveries are recorded, and that rational, happy, and mutually improving conversation is carried on, the tendency of which is, not only to expand the mind and improve the heart, but to render us also happier with each other, and happier with ourselves. Nor have the hopes of the founders of the club been at all disappointed as to the success which was likely to ensue from its institution. It has been the means of adding very many valuable facts, not only to the natural history of Berwickshire, but to that of the country generally. It has proved the district, the field of its investigations, to be one most rich and interesting in almost all the departments of natural history. It has published also, annually, for four years past, a small volume of its transactions; and from the zealous as well as the harmonious spirit by which it still continues to be animated, there is every reason to believe that it will go on increasing in knowledge, reputation, and prosperity.

The last meeting of the Club was held December 22d, at Berwick-upon-Tweed,—P. J. Selby, Esq. of Twizel House in the chair. After the reading of the minutes of former meeting, and other routine business, the following communications were read:—1. A paper by Mr Henderson "on the popular Rythmes of Berwickshire."—2. A paper by G. Darling, Esq., "on the Black Turnip Caterpillar."—3. A communication received from Sir Thomas Brisbane, entitled, "Practical observations on the Par, by James Kerse, fisher, Bowhill."—4. A paper from the Rev. T. Cook, illustrative of some facts connected with the early history of the Borders; and 5. Contributions to the Flora of the district, by Miss Bell and Dr Johnston. A number of rare and interesting birds from New Holland were also exhibited, and Dr Johnston's Collection of Land-Shells, which the Club were invited to examine, was viewed with much attention and pleasure. The rarest and most valuable contribution, however, at this meeting, was a specimen of the Mullus barbatus, or Plain red Mullet, exhibited by the Rev. A. Baird, of Cockburnspath, who procured it from one of the fishermen in that parish, in the month of August last. It was taken in a herring-net, and was a beautiful and full-grown specimen. Though this fish has for some time occupied a place in the British Fauna, it may be stated that its claim rests merely on a vague remark of Mr Pennant, who acknowledges that he never saw it. A single specimen, it is believed, is in the British Museum, but it is uncertain whence it was procured. The individual exhibited on this occasion therefore may be considered as the only authentic British specimen which has been preserved of this famed and beautiful fish. The next meeting of the Club was fixed to be held at Houndwood, on the first Wednesday of May, 1837.

Tweedside Physical and Antiquarian Society.—A Quarterly Meeting of this Society took place here on Monday last, Sir Thomas Makdougall Brisbane, Bart., the Society's President, in the chair.

The list of donations to the Museum received since last meeting was read over, and the thanks of the Society were unanimously voted to the donors. We may specify the following as among the most important of the new acquisitions:—

From Walter Elliot, Esq. Wolflee.—Forty-six skins of birds from India, some of them of rich and beautiful plumage.

From a friend to the institution.—A collection of ancient and modern British coins. Among these are a Penny of William the Lion; Penny of Henry II.; the regal and episcopal Durham Pennies of Edward I.; the Half Groats of Elizabeth and Henry VIII.; &c. &c.

From his Grace the Duke of Roxburghe.—1st, Stuffed specimen of Crested Cormorant; 2d, The male and female Mergansers; 3d, Male and female Cornish Chough; 4th, Male Royston Crow.

From Sir Thomas Makdougall Brisbane, Bart. of Makerston.—1st, Two stuffed specimens (male and female) of the Passenger pigeon; 2. Specimen of the Harlequin Duck; 3d, Specimen of the Snowy Owl. The two last are especially interesting as rare and beautiful specimens of the British Fauna, though the individuals sent to the Museum were not shot in this country.

From Adam B. Boyd, Esq. of Cherrytrees.—A curiously marked pyebald Mouse, killed at Cherrytrees.

From Mrs Tait, Whitehill.—Collection of Eggs of the common domestic Fowl, presenting some singular varieties.

Other interesting and appropriate donations were received from Mrs Redpath; Major Watson; Mr Charles Douglas; Miss Jane Wilson; Mr Fulton, Hatchednize; Mr W. Wheelans; &c. &c.

Birds and Quadrupeds for preservation were received from Lady Polwarth; the Duke of Roxburghe; Mrs Roberton, Ladyrigg; Mr Boog; Mr Beckwith; Mr Peter Darling; Sir Thomas M. Brisbane; Mr Stuart; Mr Forrest, gunsmith; &c. &c. This is a kind of contribution which the Society is always glad to acknowledge; and we hope that its friends will continue their attentions. If they would take the trouble of visiting the Museum—and to those who will make allowances for the Society's limited means, and the short period of its existence, it is now worthy of a visit—they would best ascertain what are the deficiencies, numerous as they are, which still remain to be filled up. It gives us pleasure to learn that a gentleman is now engaged in making a collection of the Fishes of the district, which we hope to see soon occupying a place in the Museum.

The following office-bearers were elected for the ensuing year:—

PRESIDENT.

Sir Thomas Makdougall Brisbane, Bart., K. C. B., &c.

John Hodgson Hinde, Esq., M. P.
Major General Elliot of Rosebank,
P. J. Selby, Esq. of Twizell House,
Robert Wilkie, Esq. of Ladythorn,
} Vice-Presidents.

Dr Wilson, Kelso, Secretary.
Mr Currie, Kelso, Treasurer.

Dr Douglas,
Major Watson,
Mr Stuart,
Mr Smith,
} Curators.

Mr Robert Frain, Trows, Hon. Artist.

The thanks of the Society were voted to those gentlemen who had acted as office-bearers during the past year, and the meeting expressed its satisfaction with the progress which had been made with the Museum while under their charge.

The Treasurer being absent from the meeting, no account could be given of the state of the Society's funds, but we believe we may report them to be in a prosperous condition. Upon the whole, the success of the Institution continues to be such as is highly creditable to the state of society in the district in which it originated and has been hitherto supported. We trust that the advantages to be derived from it will yet make themselves more and more decidedly felt and acknowleged.—*Kelso Mail.*

Register of the Thermometer for 1836, kept at Applegarth Manse, taken at 9 A. M. and 9 P. M. Long. 3° 12′ W Lat. 55° 15′ N.—Height above the sea 180 feet—Distance from the sea 10 miles—Rain-gage, 10 feet from the ground. *

Days.	Jan.		Feb.		March.		April.		May.		June.		July.		August.		Sept.		Oct.		Nov.		Dec.	
	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.
1	34	29	33	31½	31	33	39½	34½	43½	35½	54⅔	48½	54½	55	55⅓	48½	51½	49	40½	43	35½	42½	31	40
2	30	31	30	31	36½	33	37½	35½	44½	36	54⅔	49	59	55½	55½	52⅔	50	44	43	40	44½	36	46	42
3	34	40	35	35½	36½	38	40	32	45½	38	59½	54	55½	54	54⅓	54½	52	51	43½	43½	41½	37	42	44
4	43	46	37½	30	40	38½	34	38	47½	42	52	52½	65	52	58	49	56	54	46	40	34	31	43½	41½
5	46	45	26	36	35½	35½	39	42	46½	41	53¼	48½	59½	60	55	53½	48	48	42	46	33	32	44½	44
6	42	40	38	33	34	38½	44	39½	48	42	53½	48	58	51	61	58	52	44	44½	42	33½	34	42	46
7	39	37½	33	30	38½	33	41	34½	54	44	54⅔	48½	56	51	63½	54½	53	47½	50¾	51	30	28½	42½	38½
8	40	38	39	45	37½	31	40½	38½	51	44½	53	52	61	54	55½	50	50½	48	52¾	44	26½	28	37½	36
9	32½	32	41½	36	35½	32	44½	39½	53½	48	53½	52	55	58	56	52½	47⅓	40	45½	46½	42	43	32½	32
10	30	29½	33½	34	35	36	42	30½	56	50	54½	52½	60	59	62	57	45½	42	46	45½	44	33	35	33
11	29	26	28	32½	36	36	40	42	58	47½	53½	50	59	54	62	60	49	47	45	44½	38	43½	30	24½
12	23	20½	39½	31½	40½	35½	46½	43	49½	46	54	52	54	49	58	59	49½	47	46	45½	38	44	29	40
13	32	38	30½	39	35	39	47	36½	48	48	55	54	51	50	62½	58	51½	43	45½	41	46½	40	38	39
14	40½	34	40	41	39	33½	41	48	56½	51	56¼	58	53	50	62½	61	53	48	39½	45	37½	39	41	34½
15	30½	29½	42	40½	35½	34½	52	44	58½	47	68	64	52	49	63½	57½	52½	45½	46	48	38	43	27	37
16	22	30	43	30½	31	36	44½	41	59	56	57⅛	54½	55	52	62¼	55½	51	45	46½	40	42½	42½	37	38½
17	32½	35	31	34½	47½	40	44	42	66	56	62½	58½	53	48	56	52½	48	44	45	46	36½	38	40½	46
18	38½	34	35½	31	42	42½	44	40	58	50	54½	54½	50	54	57	50½	49	46½	51	46½	34½	32	46	46
19	23	29	29½	32½	44	42½	46	44	56½	56	60	52½	54	46	54	50½	51	42	47	45	35	37	44	40
20	32	37⅛	30½	31½	45½	42½	45	40½	63	52½	52¼	47	50	50	54	48½	49	40	38½	44½	38	32	34	40
21	39	41½	38	40½	42	42½	46	42½	60	50	53	47	59	49	51½	51½	44	38½	46½	45½	32	36½	42	44
22	40	39½	37½	34	43½	38	44½	38	56	46	56½	52½	55	50	52	40	45	49	48½	42½	30½	34	45	39
23	44⅓	42⅔	29½	34	40½	40	42½	38	43	40	54½	53	59	52	47	42	52	53½	48	49	34	34	29	28
24	40	32½	30	30	38	33½	44	38	47	46	55½	51	50	48	51	46½	54	52	50	46	30	30	30	26
25	34	42	32	26	37½	35½	43	41	59	50½	51½	48	54	52	52	52½	53	52	48½	44	30½	33	24½	21
26	42⅓	35⅓	28	23½	39	34½	46	36½	54½	52½	55	52	53	56	50½	47	55	54	47½	48	33	35½	23	23
27	33⅓	40	32	31½	38	32	43	40	57½	52	57½	55	56	56	50½	46	56	51	36	30	37½	46	26½	29
28	35	30	35	32½	33	32½	45	32½	62½	48	56	51	56	54⅓	54	44	50	46	30½	32½	42½	42¼	28½	28
29	29⅓	26	29½	34	37	32	36	32	60½	54	55½	53	58	46½	50½	42½	45¼	46	28	32	39½	42	30	27
30	31	28			36	36½	42	38	56	48	61	53	53	48	42	53½	41	38	27½	26	33½	30	29	27
31	34	34			38	34½			60	50			52	50¼	55	54			24	29½			26	28
	38	34 6/10	34	33 5/10	38	36 3/10	42 8/10	39	54 2/10	47 4/10	55 8/10	52 2/10	56 1/10	52	55 7/10	51 7/10	50 2/10	47 8/10	43 9/10	42 8/10	36 4/10	36 7/10	35 4/10	35 5/10
	Rain, 3 8/10 in.		1 inch.		3 inches.		2 1/10 inches.		0		4 8/10 inches.		5 2/10 inches.		3 1/10 inches.		2 6/10 inches.		2 6/10 inches.		5 1/10 inches.		4 4/10 inches.	

Medium temperature of the year, 43 6-10ths. Total rain, 37 9-10 inches. Medium temperature of 1835, 45 1-4th. Total rain of 1835, 33 6-10 inches.

* We have thought the above Table would be interesting to compare with that kept at St Bathans, published regularly in the "Records of Science."